



Planetary Health Report Card (Medicine): *Brown University*



THE WARREN ALPERT
Medical School

BROWN UNIVERSITY

2024-2025 Contributing Team:

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Summary of Findings

Overall Grade	B
Curriculum	B
<ul style="list-style-type: none"> The Warren Alpert Medical School of Brown University has improved in this domain since the last PHRC. Early exposure to planetary health themes in first year courses is reinforced by integrated clinical cases in the second-year Doctoring curriculum. The new Planetary Health Scholarly Concentration (PHSC) allows students to engage in longitudinal study over the four years. Recommendations: We recommend further focus on integrating planetary health into the core curriculum, including the impact of hospital systems and environmental change on human health. 	
Interdisciplinary Research	A-
<ul style="list-style-type: none"> This year the Planetary Health Initiative (PHI) was launched in the Division of Biology and Medicine. The PHI expands planetary health curriculum efforts, community engagement, and connects students with interdisciplinary research opportunities. Existing funding opportunities may support student-projects in this area, but are not specific to planetary health. The medical school has several investigators with planetary health-related foci. Additionally, students in the new PHSC will pursue longitudinal research related to planetary health. The inaugural class has 3 concentrators partnering with faculty mentors. Recommendations: Further opportunities for planetary-health specific funding could help foster more student involvement and research within this space. 	
Community Outreach and Advocacy	C+
<ul style="list-style-type: none"> The ECo student group at the medical school has maintained its relationship with the Providence Neighborhood Planting Program. Improvements since last year include efforts by the newly-established PHI to incorporate community member voices into planetary health projects. Brown doctors and medical students are actively involved in Rhode Island Medical Society's planetary health committee. Recommendations: Development of community partnerships and deepening of existing relationships may improve the status of community outreach and advocacy efforts. Interdisciplinary work between the university, its affiliated hospitals, and community groups to bring educational opportunities in planetary health education to clinical spaces would also bolster much-needed advances in community education. 	
Support for Student-Led Initiatives	A
<ul style="list-style-type: none"> The PHI has been established, and its steering committee includes medical and graduate students. The establishment of the PHSC and its website provide specific opportunities for students to connect and work with faculty conducting research on planetary health topics. The medical school also continues to support the ECo interest group and Brown's Office of Sustainability offers a seed grant to sustainability projects. Recommendations: Currently, support for student-led environmental initiatives mostly comes from the University rather than the Medical School. Increased support from the medical school for student-led sustainability initiatives and increased funding opportunities would bolster this domain. 	
Campus Sustainability	B
<ul style="list-style-type: none"> There have been no significant changes in medical school campus sustainability since the last PHRC report. Recommendations: Potential improvements include improving lab sustainability, establishing and implementing rigorous sustainability guidelines for events and procurement, and full fossil fuel divestment. 	

Statement of Purpose

Planetary health is human health.

The Planetary Health Alliance describes planetary health as “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth.” This definition is intentionally broad, intended to encompass the multitude of ways that the environment can affect health, including water scarcity, changing food systems, urbanisation, biodiversity shifts, natural disasters, climate change, changing land use and land cover, global pollution, and changing biogeochemical flows. The health of humanity is dependent on our environment, and our environment is changing rapidly and in disastrous ways. Although the World Health Organization has called climate change “the greatest threat to global health in the 21st century,” many medical school’s institutional priorities do not reflect the urgency of this danger to human health.

As future health professionals, we must be prepared to address the impacts of human-caused environmental changes on our patients’ health. This preparation is in the hands of the institutions providing our medical training. It is imperative that we hold our institutions accountable for educating medical students about the health impacts of climate change and other anthropogenic environmental changes, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices as much as possible, and engaging with surrounding communities that are most affected by environmental threats. Because climate change and environmental threats disproportionately affect vulnerable populations (for example, communities of colour, older adults sensitive to health threats, and individuals in low-resource settings), these issues are inherently ones of equity and justice.

With the purpose of increasing planetary health awareness and accountability among health professional schools, we have created a Planetary Health Report Card that students internationally can use to grade and compare their institutions on an annual basis. This student-driven initiative aims to compare health professional schools nationally and internationally on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) interdisciplinary research in health and environment, 3) university support for student planetary health initiatives, and 4) community outreach centred on environmental health impacts 5) medical school campus sustainability.

Definitions & Other Considerations

Definitions:

- **Planetary Health:** is described by the Planetary Health Alliance as “the health of human civilisation and the state of the natural systems on which it depends.” For example, topics such as climate change, declining biodiversity, shortages of arable land and freshwater, and pollution would all fall under the realm of planetary health. Both planetary health and traditional ‘environmental health’ examine the relationship between human health and the external environment, including extreme temperatures, chemicals, vector-borne diseases, etc. Planetary health explicitly concerns itself with the potential health harms associated with human-caused perturbations of natural systems. Therefore, the human health focus of planetary health makes the field well-adapted for the context of medical school education. Throughout this report card, we use the term planetary health to refer to this broad swath of topics, but resources do not need to explicitly include the term “planetary health” to satisfy the metric.
- **Sustainable Healthcare:** As defined by the Academy of Royal Colleges, sustainable healthcare involves ensuring the ability to provide good quality care for future generations by balancing the economic, environmental, and social constraints and demands within health care settings. A sustainable healthcare system maintains population health, reduces disease burden and minimises use of healthcare services.
- **Education for Sustainable Healthcare (ESH):** is defined as the process of equipping current and future health professionals with the knowledge, attitudes, skills and capacity to provide environmentally sustainable services through health professional education, thus working to decrease the enormous environmental impact of the healthcare industry. Planetary Health Education is an integral part of this education rather than an end in itself. This is because knowledge on Planetary Health is required to be able to fully understand the necessity of sustainable healthcare as well as being part of the broader knowledge needed to fully protect and promote health. In summary, ESH is covered by the three Priority Learning Outcomes of the Centre of Sustainable Healthcare below, and Planetary Health Education is embraced in the first learning objective and is a fundamental requirement to achieve learning outcomes 2 and 3:
 1. Describe how the environment and human health interact at different levels.
 2. Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems.
 3. Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment.
- **Medical School/Department vs. Institution:** When “Medical school” is specified in the report card, this only refers to curriculum and resources offered by the School/department of Medicine and does not include offerings from other parts of the university (e.g. undergraduate departments (USA), other related departments (e.g. Public Health, Population Health departments). In contrast, when “institution” is specified in the report card, we are referring to the university more broadly including all of its campuses. Any resource reasonably accessible by medical students, no matter where in the institution the resource comes from or if it is

specifically targeted for medical students, can meet this metric.

- **Environmental history (Metric #19 in Curriculum Section):** This is a series of questions students are taught to ask during medical encounters that elicits patients' exposures and environmental risk factors. Historically, this has included consideration of exposures like pesticides, asbestos, and lead, though in the modern era shaped by climate change, it can be expanded to include things like wildfire smoke exposure, air pollution and mould after flooding. Key components include place of residence over the lifecourse, occupational history, food and water sources (e.g. meat from industrial feeding operations, regular fishing in contaminated water, access to clean drinking water), and exposure to air pollution. Please be as specific as possible when providing evidence for this metric.
- **Elective:** The word "elective" refers to an optional course or lecture series that a medical student can opt to take part in but is not a requirement in the core curriculum. Generally, these elective courses take place in the preclinical curriculum but vary by school.
- **Core Curriculum:** This refers to taught material that is delivered to the entire cohort of students in one year.
- **Clerkship / Outreach:** This is a term used in the USA to refer to placements that medical students go on e.g. Pediatrics, General medicine, Psychiatry. In the UK these are referred to as rotations, outreach or placements. This is a relatively short (approximately 4-8 weeks) period of study and patient-centred clinical experience that takes place as part of the undergraduate programme.
- **Clinical rotation:** This is a term used to refer to placements that students go on (e.g., ophthalmology, surgery, cardiology).
- **Physiotherapy vs Physical Therapy:** For the purposes of this report card these terms are considered interchangeable. However, physiotherapy will be used primarily.
- **Community organisations:** For most institutions, there are existing groups that are not directly affiliated with the university and exist as a product of what the community the institution exists in cares about or needs. These specific community organisations relevant to this report include those that are focused around some aspect of climate and health preservation. These community organisations can include but are not limited to local mutual aid initiatives, underserved-resource distribution groups, clean-up and nature conservation groups, community gardeners, and other environmental-related organisations. If your institution does not have access to local volunteerships with community groups, please report any community organisations your institution or school has collaborated with.
- **Climate justice:** The idea that certain population groups and geographical locations which are disproportionately more impacted by climate change are already economically and socially disadvantaged. This double vulnerability sits alongside pre-existing social justice concerns and should therefore shift policy and practice to mitigate the inequitable effects of the climate crisis.
- **Extractivism:** The removal of natural resources typically in large quantities. Within anthropology this term is often used in the context of colonialism to refer to

the historic seizing of natural resources, a practice which has developed business models tied to ecological degradation and loss of biodiversity.

- **Global South:** Nations that often have less economic and industrial development and are typically in the southern hemisphere. These nations have been found to be disproportionately impacted by the climate crisis.
- **Low socioeconomic status (SES):** An individual or geographical area that across a variety of socioeconomic factors (e.g., income, education, race/ethnicity) is considered vulnerable. This vulnerability has been correlated to more adverse health outcomes often as a consequence of encountering more barriers in accessing and receiving healthcare.
- **Low and Middle-Income Countries (LMIC):** Countries that have lower degrees of economic affluence.
- **Anthropogenic:** Created through human activity
- **Marginalized communities:** Groups excluded from mainstream economic, educational, social, and/or cultural experiences due to race, gender identity, sexual orientation, age, physical ability, language, and/or immigration status (Sevelius et al., 2020).

Other considerations:

- If there are more than one “tracks” at your institution with two different curricula (for example, Harvard Medical School has a Pathways and HST curriculum track), you can choose to fill out a report card for each track, or fill out just one report card and average the scores received by each track in cases where the scores are different (see the 2021 Harvard or Oxford report cards as examples). Where possible please indicate the proportion of students that are on each track.

Completed in 2022 a [Literature Review by Metric](#) is available for the 2022 medicine report card metrics. We are in the process of updating this review and making it more applicable to all the disciplines. However the review serves as a rough collection of references for further learning and a resource for those advocating for increased planetary health engagement at their institutions.

Planetary Health Curriculum

Section Overview: *This section evaluates the integration of relevant planetary health topics into the medical school curriculum. Today's medical students will be on the frontlines of tackling the health effects of climate and other environmental changes. Therefore, it is critical that medical students are trained to understand the health effects of these changes, as well as planetary health issues and principles more broadly. Topics like the changing geography of vector-borne diseases, the health consequences of air pollution, environmental health inequities, and disaster response principles must be part of every medical school's core curriculum.*

Curriculum: General

1.1. Did your <u>medical school</u> offer elective courses (student selected modules) to engage students in Education for Sustainable Healthcare or Planetary Health in the last year?	
Yes, the medical school has offered more than one elective whose primary focus is ESH/planetary health in the past year. (3 points)	
Yes, the medical school has offered one elective whose primary focus is ESH/planetary health in the past year. (2 points)	
The medical school does not have any electives whose primary focus is ESH/planetary health, but there are one or more electives that include a lecture on planetary health. (1 points)	
No, the medical school has not offered any electives on planetary health or electives that include ESH/planetary health topics in the past year. (0 points)	
Score Assigned:	2
<p><i>Score explanation: The Warren Alpert Medical School offered a semester-long preclinical elective titled Planetary Health for the fourth year in a row. This was led by Brown faculty members, Dean Katherine Smith and Dr. Kyle Martin, in collaboration with medical students. The elective focused on how shifts in weather patterns, land use change, and increased contact between humans and animals have led to new threats to human health, specifically highlighting emerging infectious disease, mental health, heat-related illness, and natural disaster. The elective featured speakers, small group discussions and 6 hours of community-based activity relevant to planetary health. The elective created the service learning component in this most recent year to encourage participation in local planetary health initiatives.</i></p> <p><i>Additional electives which include content on planetary health include Wilderness & Environmental Medicine (post-clerkship), Wilderness Medicine, Endurance Medicine and Practical Skills in EMS and Disaster Response.</i></p>	

Curriculum: Health Effects of Climate Change

1.2. Does your medical school curriculum address the relationship between extreme heat, health risks, and climate change?

This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned	3
<p><i>Score explanation: As part of the M1 core curriculum at Brown, the course Health Systems Science includes lectures titled "Occupational Health and Climate Change" and "Planetary Health". The former explores the intersections of global warming and health risks; specifically, the lecture covered heat-related disorders, increased mortality during heat waves, and individual risk factors totalling about 10 of 107 slides. The latter is an introduction to planetary health and certain health related impacts of climate change. There are several slides detailing how warmer temperatures are increasing vector-borne disease in the context of climate change. Nearly twenty percent of the lecture slides are dedicated to extreme heat explaining how the US is reaching new heat records, how extreme heat impacts various organ systems, common heat-related illness symptoms, risk factors amongst different age groups, and how urban heat islands in Rhode Island are negatively impacting local populations. Time was allotted to think-pair-share on the topic of extreme heat.</i></p> <p><i>Other lectures and small group assignments during the first semester of the M1 curriculum briefly discussed this relationship, and the M1 doctoring curriculum includes a didactic day on taking environmental health histories.</i></p>	

1.3. Does your <u>medical school</u> curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned:	2
<p><i>Score explanation: As part of the M1 core curriculum at Brown, the course Health Systems Science includes a lecture titled "Occupational Health and Climate Change" which briefly covers the topic of extreme weather and individual health. Specifically, the lecture mentions changes in precipitation resulting in stronger hurricanes, floods, droughts, and sea-level changes leading to human injury, death and population displacement over two slides. A "Planetary Health" lecture briefly discussed extreme weather and its impacts on health and the healthcare system in the core curriculum.</i></p> <p><i>Other preclinical electives including Planetary Health and Wilderness Medicine briefly discussed extreme weather events such as flooding, hurricanes, droughts and forest fires and their impact on health and the health system.</i></p>	

1.4. Does your medical school curriculum address the impact of climate change on the changing patterns of infectious diseases?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 points)

Score Assigned:

3

Score explanation: As part of the first-year course Health Systems Science at Brown, the lecture "Occupational Health and Climate Change," global warming resulting in wider and longer transmission of vector-borne diseases such as West Nile, Lyme and Malaria and the increase in floods and droughts increasing waterborne diseases is discussed over four slides. This impact is also briefly discussed during the Microbiology/Infectious Disease block in the fall semester of the M1 curriculum. The lecture "Planetary Health" given during first-year discussed the effect of climate change as it relates to the spread and transmission of Lyme Disease and Alpha Gal over six slides. There are several lectures in the Microbiology/Infectious Disease course diving into this topic.

1.5. Does your medical school curriculum address the respiratory health effects of climate change and air pollution?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 points)

Score Assigned:

3

Score explanation: As part of the M1 core curriculum at Brown, the course Health Systems Science includes a lecture titled "Occupational Health and Climate Change" which discusses the relationship between greenhouse gases, climate change, and respiratory/allergic disorders. Specifically, the lecture provides an overview of the dramatic increase in atmospheric carbon dioxide and methane levels over the past few decades and exacerbations of asthma, COPD, and allergic rhinitis due to atmospheric ozone, particulate matter, and increased pollen production. This is discussed over ten slides including infographics. The lecture "Planetary Health" given during first-year discussed the effect of climate change on increasing smog, particulate air pollution, and wildfires which all exacerbate respiratory conditions such as asthma and COPD. In the M2 core curriculum a lecture titled "Environmental Lung Disease" discusses how air pollution and particulate matter exacerbate respiratory illness.

1.6. Does your medical school curriculum address the cardiovascular health effects of climate change, including increased heat

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 point)

Score Assigned:

2

Score explanation: As part of the required first-year course Health Systems Science at Brown, the lecture "Occupational Health and Climate Change" briefly mentions the relationship between climate change and cardiovascular health effects in its exacerbation of coronary artery disease over one slide. The lecture "Planetary Health" given during first-year discussed the effect of climate change on the cardiovascular system especially as it relates to heat as well as how certain respiratory health effects of climate change can exacerbate cardiovascular health.

1.7. Does your medical school curriculum address the mental health and neuropsychological effects of environmental degradation and climate change?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 points)

This topic was **not** covered. (0 points)

Score Assigned:

2

Score explanation: As part of the M1 core curriculum at Brown, the course Health Systems Science includes a lecture titled "Occupational Health and Climate Change" that mentions mental health consequences including anxiety, worry, depression and despair, and PTSD in association with climate change. The lecture "Planetary Health" given during first-year briefly discussed the mental health effects of climate change and environmental degradation.

The Planetary Health pre-clinical elective featured speaker Dr. Joshua Wortzel, highlighting his research on the impacts of climate change and extreme weather events on mental health, both in the community and within the medical field.

1.8. Does your medical school curriculum address the relationships between health, individual patient food and water security, ecosystem health, and climate change?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned:	3
<p><i>Score explanation: As part of the first-year course Health Systems Science, the lecture “Planetary Health” given during first-year discusses how the continued degradation of natural systems, including land use changes, water scarcity, and changing food systems, both from climate change and individual behaviors, impact health. Additionally, the Intro to Nutrition Science lecture in the first-year Scientific Foundations of Medicine course reviews the interactions between climate, food systems, and human health.</i></p>	

1.9. Does your <u>medical school</u> curriculum address the outsized impact of climate change on marginalised populations such as those with low SES, women, communities of colour, Indigenous communities, children, homeless populations, and older adults?	
This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 point)	
Score Assigned:	3
<p><i>Score Explanation: As part of the required first-year course Health Systems Science, the lecture "Occupational Health and Climate Change" has one slide that reveals populations in which climate change worsens existing socioeconomic inequities. The slide lists people with low-incomes, people belonging to minority groups, immigrants, women, children, older adults, individuals with chronic disease and/or disabilities without going into further detail about each group. The lecture “Planetary Health” given during first-year discussed how climate justice equals social justice by showing how warmer temperatures will disproportionately affect those of low SES, especially people experiencing homelessness. This lecture also details how US islands in the Caribbean and Pacific are particularly vulnerable to climate change and lists both recent impacts and downstream effects of specific climate change outcomes such as increased water temperatures, sea level rise, increased intensity of tropical storms, and changing precipitation. The lecture goes on to explain that US territories do not have equal access to climate change relief funding that aids the states after natural disasters.</i></p>	

1.10. Does your <u>medical school</u> curriculum address the unequal regional health impacts of climate change globally?	
This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	

This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned:	2
<i>Score Explanation: As part of the first-year course Health Systems Science at Brown, the lecture "Occupational Health and Climate Change" briefly discussed the relationship between climate change and global social injustice. The lecture mentions how "countries with most GHG emissions suffer the least", and "countries with the most greenhouse gas emissions suffer the most" over two slides. The lecture also briefly discusses the role of climate change in the Syrian Civil War, where drought and food shortages played a role in socioeconomic and political instability leading to armed conflict.</i>	

Curriculum: Environmental Health & the Effects of Anthropogenic Toxins on Human Health

1.11. Does your <u>medical school</u> curriculum address the reproductive health effects of industry-related environmental toxins (e.g. air pollution, pesticides)?	
This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned:	2
<i>Score Explanation: A first-year lecture entitled "Teratogens" outlined certain exposures that could cause birth defects including radiation and chemical exposure. Another lecture entitled "Occupational Health and Climate Change" briefly mentions the negative impact of pesticides on reproductive health, specifically citing how DBCP-exposed farm workers in the Philippines were inadvertently sterilized.</i>	

1.12. Does your <u>medical school</u> curriculum address important human-caused environmental threats that are relevant to the university's surrounding community?	
This topic was explored in depth by the core curriculum. (3 points)	
This topic was briefly covered in the core curriculum. (2 points)	
This topic was covered in elective coursework. (1 point)	
This topic was not covered. (0 points)	
Score Assigned:	3
<i>Score Explanation: As part of the first-year course Health Systems Science, lead poisoning and mold exposure disparities in Rhode Island, as well as how to advocate for better living conditions</i>	

for patients, are discussed.. The lecture “Introduction to Planetary Health” also discusses the impacts of extreme heat in Rhode Island specifically impacting urban heat islands and individuals experiencing homelessness in Providence. A member from the Rhode Island Executive Office of Health and Human Services delivered a lecture entitled “State of Health in Rhode Island” also describes addressing climate change as a priority in improving health in RI.

1.13. To what extent does your medical school emphasise the importance of Indigenous knowledge and value systems as essential components of planetary health solutions?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 points)

Score Assigned:

2

Score Explanation: The required first-year course Health Systems Science included a lecture titled "Introduction to Indigenous Health" that discusses the important connections between indigenous populations, land, food sovereignty, and health outcomes. Planetary health solutions and conservation practices were briefly discussed in the context of the indigenous Chamoru population of Guam. Another lecture called “Introduction to Planetary Health” briefly mentions that addressing climate change will entail collaboration with many groups, including indigenous communities.

1.14. Does your medical school curriculum address the outsized impact of anthropogenic environmental toxins on marginalised populations such as those with low SES, women, communities of colour, children, homeless populations, Indigenous populations, and older adults?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 point)

Score Assigned:

3

Score Explanation: Through a required small group assignment on Asthma, Mold, and Housing Code Protections this year, MSI students researched and prepared mock legislative testimonies on protecting children and vulnerable populations from household environmental exposures. Through this assignment, students were able to learn about environmental justice disparities at the local and national level. Time was spent discussing this topic in Health Systems Science small groups. The lecture “Planetary Health” given during first-year discussed how climate justice equals social

justice by showing how warmer temperatures will disproportionately affect those of low SES, especially people experiencing homelessness. The “Occupational Health and Climate Change” lecture describes how families in older, low-income housing are often exposed to lead dust from old paint and also how those of low SES are incentivized into hazardous work via higher pay.

Curriculum: Sustainability

1.15. Does your medical school curriculum address the environmental and health co-benefits of a plant-based diet?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 points)

Score Assigned:

2

Score Explanation: As part of the M1 core curriculum at Brown, the course Health Systems Science includes a lecture titled “Planetary Health,” which briefly discusses how a transition to more sustainable plant-based diets can reduce the environmental footprint of agriculture and improve health. In a first year lecture titled “Weight Control, Popular Diets and Other Interventions,” the Mediterranean and vegetarian diets are described as plant-based diets that are sustainable. In the first year ‘Introduction to Nutritional Science’ lecture, slides covered the link between greenhouse gases and food waste, as well as the environmental impact of agricultural intensification.

1.16. Does your medical school curriculum address the carbon footprint of healthcare systems?

This topic was explored **in depth** by the **core** curriculum. (3 points)

This topic was **briefly** covered in the **core** curriculum. (2 points)

This topic was covered in **elective** coursework. (1 point)

This topic was **not** covered. (0 point)

Score Assigned:

1

Score Explanation: The Planetary Health elective briefly discussed the carbon footprint of the health care system and recent efforts to quantify the carbon footprint. Dr. Kyle Martin spoke to the fact that the healthcare industry is responsible for a large proportion of the United States carbon emissions due to electricity and waste production. This highlighted the reciprocal impacts of the healthcare industry on climate change, and the impacts of climate change on healthcare. The Anesthesiology Interest Group hosted physicians whose scholarly work traces the link between anesthetic gases and greenhouse gas emissions from healthcare.

1.17. Does your <u>medical school</u> curriculum cover these components of sustainable clinical practice in the <u>core</u> curriculum? (points for each)	
The health and environmental co-benefits of avoiding over-medicalisation, over-investigation and/or over-treatment (2 points)	
The environmental impact of pharmaceuticals and over-prescribing as a cause of climate health harm. Alternatively teaching on deprescribing where possible and its environmental and health co-benefits would fulfil this metric. (2 points) .	
The health and environmental co-benefits of non-pharmaceutical management of conditions where appropriate such as exercise or yoga classes for type 2 diabetes; social group activities such as gardening for mental health conditions; active transport such as bicycle schemes. This is commonly known as social prescribing in the UK. (1 point)	
Environmental impact of surgical healthcare on planetary health and the climate crisis, and how can it be mitigated. (1 point)	
The impact of anaesthetic gases on the healthcare carbon footprint and ways to reduce anaesthesia's environmental impacts, such as total intravenous anaesthesia or choosing less environmentally harmful anaesthetic gas options with reduced greenhouse gas emissions. (1 point)	
The impact of inhalers on the healthcare carbon footprint and the environmental benefit of dry powdered inhalers over metered dose inhalers. (1 point)	
Waste production within healthcare clinics and strategies for reducing waste in clinical activities (e.g. single use items in the inpatient or outpatient setting) (1 point)	
Score Assigned:	1
<i>Score Explanation: In the introduction to planetary health and advocacy given in the required first-year Health Systems Science course, Drs. Martin and Smith discuss the health and environmental co-benefits of alternative transportation and outdoor space utilization. There are brief mentions against overutilization of tests and overprescription of certain medications in several other lectures, but they do not address the environmental impact of these practices. As stated under 1.16, the impact of anesthetic gases on healthcare carbon footprint was discussed in an <u>elective</u> course.</i>	

Curriculum: Clinical Applications

1.18. In training for patient encounters, does your <u>medical school's</u> curriculum introduce strategies to have conversations with patients about the health effects of climate change?
Yes, there are strategies introduced for having conversations with patients about climate change in the core curriculum. (2 points)
Yes, there are strategies introduced for having conversations with patients about climate change in elective coursework. (1 points)

No, there are not strategies introduced for having conversations with patients about climate change. (0 points)	
Score Assigned:	2
<i>Score Explanation: In the Planetary Health elective there was a session dedicated to how doctors can talk about the physical and mental health consequences of climate change with their patients. The Doctoring 1 course included a didactic titled Planetary Health. The didactic required precourse work in the form of readings and watching a Ted Talk by Dr. Courtney Howard entitled “Healthy Planet, Healthy People”. The didactic involved small group discussion featuring the topic of planetary health and its impact on patients.</i>	

1.19. In training for patient encounters, does your <u>medical school’s</u> curriculum introduce strategies for taking an environmental history or exposure history?	
Yes, the core curriculum includes strategies for taking an environmental history. (2 points)	
Only elective coursework includes strategies for taking an environmental history. (1 point)	
No, the curriculum does not include strategies for taking an environmental history. (0 points)	
Score Assigned:	2
<i>Score Explanation: As part of the year one Doctoring curriculum at Brown, the medical interview includes an exposure history where students learn to ask questions about environmental exposures and hazards at home and at work. Questions include “Have you ever changed or wanted to change your residence due to a health concern?” “is there anything about your current physical home and neighbourhood that might be impacting your health?” and “are you exposed to any health hazards at work such as chemicals and dust?” Further, there was a Doctoring class on how to conduct an environmental exposures questionnaire during patient encounters.</i>	

Curriculum: Administrative Support for Planetary Health

1.20. Is your <u>medical school</u> currently in the process of implementing or improving Education for Sustainable Healthcare (ESH)/planetary health education?	
Yes, the medical school is currently in the process of making major improvements to ESH/planetary health education. (4 points)	
Yes, the medical school is currently in the process of making minor improvements to ESH/planetary health education. (2 points)	
No, there are no improvements to planetary health education in progress. (0 points)	
Score Assigned:	4
<i>Score Explanation: As part of a restructuring of the preclinical curriculum, the Planetary Health Curricular Integration Committee and now the Planetary Health Initiative have assisted in the process of pitching additional planetary health related material to most courses in the pre-clinical</i>	

educational sequence. The Office of Medical Education has expressed support for this effort and encouraged meeting with course leaders to discuss appropriate inclusion within each course. Students have met with faculty who teach during four learning blocks, Microbiology/Infectious Diseases, Nutrition/Metabolism, Cardiology, and Pulmonology, to discuss ways in which they can incorporate planetary health into their curriculum. Some faculty have already expressed interest in adding a slide or case study into their lectures where planetary health is applicable. Within the M2 curriculum, faculty have incorporated planetary health concepts into various Integrated Clinical Curriculum (ICC) cases relevant to specific systems blocks (e.g., within the pulmonology block, discussing connections between pediatric asthma and various planetary health topics).

The school has recently approved planetary health as one of twelve longitudinal threads to incorporate into curricular revision. Learning objectives include describing how anthropogenic changes to natural systems influence health outcomes, articulating the disproportionate impact of environmental changes on marginalized populations, incorporating knowledge of environmental change into clinical practice, proposing strategies to engage marginalized populations in making decisions that affect health of populations and ecosystems, communicating messages on planetary health to patients and lay audiences, and proposing strategies to achieve “patient-planet health co-benefits”.

1.21. How well are the aforementioned planetary health/Education for Sustainable Healthcare topics integrated longitudinally into the core curriculum?

Planetary health/ESH topics are **well integrated** into the core medical school curriculum. (6 points)

Some planetary health/ESH topics are appropriately integrated into the core medical student curriculum. (4 points)

Planetary health/ESH is not integrated and is primarily addressed in **(a) standalone lecture(s)**. (2 points)

There is **minimal/no** education for sustainable healthcare. (0 points)

Score Assigned:

4

Score Explanation: For the 2024-25 year, medical school course leaders have allocated standalone lectures focused on environmental health and climate change, subsequent references to planetary health are mostly absent from the curriculum. Currently, there is no longitudinal integration of planetary health in the core-curriculum. The student-led Planetary Health Curriculum Committee sought to increase mentions of planetary health into subsequent course material following the first semester of M1 and its dedicated standalone lectures.

1.22. Does your medical school employ a member of faculty to specifically oversee and take responsibility for the incorporation of planetary health and sustainable healthcare as a theme throughout the course?

Yes, the **medical school** has a specific faculty/staff member responsible for overseeing curricular integration of planetary health and sustainable healthcare. (1 point)

No, the **medical school** does **not** have a specific faculty/staff member responsible for overseeing curricular integration of planetary health and sustainable healthcare. (0 points)

Score Assigned:

0

Score Explanation: As of 2024-25, the medical school does not have a specific faculty/staff member responsible for this aspect of curricular integration nor are there any plans in place for the designation of such a position, although Dean Katherine Smith and Dr. Kyle Martin are serving in this capacity.

Section Total (52 out of 72)

72%

Back to Summary Page [here](#)

Interdisciplinary Research

Section Overview: *This section evaluates the quality and quantity of interdisciplinary planetary health research at the broader institution. Interactions between health and the environment are complex and multifactorial. While climate change has been extensively studied from an environmental science perspective, planetary health is an emerging field. As leading health institutions with talented researchers and research resources, institutions should fund research studying the health effects of climate change and anthropogenic environmental toxins. This obligation is particularly strong because the public and policymakers are more attentive to climate change when its implications for human health are emphasised.*

2.1. Are there researchers engaged in planetary health research and healthcare sustainability research at your <u>institution</u>?	
Yes, there are faculty members at the institution who have a primary research focus in planetary health or sustainable healthcare/vetcare. (3 points)	
Yes, there are individual faculty members at the institution who are conducting research related to planetary health or healthcare sustainability, OR are part of a national/international sustainability working group, but it is not their primary research focus. (2 points)	
There are sustainability researchers at the institution , but not specifically associated with healthcare/vetcare. (1 point)	
No, there are no planetary health and/or sustainability researchers at the institution at this time. (0 points)	
Score Assigned:	3
<p><i>Score explanation: There are several investigators affiliated with The Warren Alpert Medical School of Brown University who have a primary research focus in planetary health, specifically the human health consequences of environmental/occupational toxin exposures and reducing hospital waste. Many faculty in Pathology and Laboratory Medicine at Brown focus on environmental exposures, including Dr. Jeff Bailey. Dr. David A. Savitz, Professor of Epidemiology with joint appointments in OB/GYN and Pediatrics, conducts research on the health effects of environmental agents on reproductive health outcomes. In addition, Assistant Professors of emergency medicine Dr. Katelyn Moretti and Dr. Kyle Denison Martin are working with several medical students to reduce waste in the ED at Miriam Hospital and Kent Hospital. Dr. Allan Just and Dr. Joseph Braun in the School of Public Health study the effects of air pollution and chemical toxins, respectively, on human health. Dr. Bryce Perler is leading a composting effort at Rhode Island Hospital in addition to research on the sustainability of plant-based diets in the healthcare system. Dr. Ankur Shah, an Assistant Professor of Medicine, has been involved in climate change advocacy both regionally and nationally, and contributed to the American Society of Nephrology's statement on climate change. This is not a comprehensive listing of all faculty interested in this area, and there have been increasing numbers of professors interested in this area. In May 2022, The Warren Alpert Medical School of Brown University introduced the Ruth Sauber Medical Education Fund for Planetary Health. This new initiative will allow third and fourth year medical students to pursue a gap year conducting research projects related to planetary health. Additional research efforts should be focused on other topics including health consequences of extreme temperatures, vector-borne diseases, and air pollution.</i></p>	

2.2. Is there a dedicated department or institute for interdisciplinary planetary health research at your institution?

There is **at least one** dedicated department or institute for interdisciplinary planetary health research. (3 points)

There is **not currently** a department or institute for interdisciplinary planetary health research, but there are **plans** to open one in the next 3 years. (2 points)

There is an **Occupational and Environmental Health department**, but no interdisciplinary department or institute for planetary health research. (1 points)

There is **no** dedicated department or institute. (0 points)

Score Assigned:

2

Score explanation: The recently established Planetary Health Initiative steering committee recently applied for grants to support research on campus regarding emerging fungal pathogens and healthcare sustainability. The committee intends to establish a natural home for interdisciplinary planetary health research in the coming year.

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?

Yes, there is a process in which community members impacted by climate and environmental injustice have **decision-making power** in the climate + environmental research agenda. (3 points)

Yes, there is a process in which community members impacted by climate and environmental injustice **advise** the climate + environmental research agenda. (2 points)

No, but there are **current efforts** to establish a process for community members to advise or make decisions on the research agenda. (1 points)

There is **no** process, and **no** efforts to create such a process. (0 points)

Score Assigned:

1

Score explanation: There are multiple efforts currently underway at the medical school to incorporate the contributions of disproportionately impacted communities in the work of researchers. The Division of Biology and Medicine has established a dedicated Community Engagement division, which could play a key role in this process. The Division's [newly revised mission statement](#) (fall 2023) explicitly emphasizes planetary health: "The mission of the Division of Biology and Medicine at Brown University is to advance knowledge and the health and well-being of people and planet." This strategic shift reflects a significant accomplishment and the culmination of long-standing advocacy efforts, creating a clear framework for future action. The establishment of the Planetary Health Initiative further reaffirms this commitment, and the PHI

steering committee aims to elucidate ways for community members to advise and make decisions on the research agenda in the coming years.

2.4. Does your institution have a planetary health website that centralises ongoing and past research related to health and the environment?

There is an **easy-to-use, adequately comprehensive** website that **centralises** various campus resources related to health and the environment including all of the following: upcoming events, leaders in planetary health at your institution, and relevant funding opportunities. (3 points)

There is a website that **attempts to centralise** various campus resources related to health and the environment, but it is hard-to-use, not updated, or not adequately comprehensive. (2 points)

The **institution** has an **Office of Sustainability website** that includes **some** resources related to health and the environment. (1 point)

There is **no** website. (0 points)

Score Assigned:

3

Score explanation: There is a centralized integrated website specifically dedicated to planetary health: <https://planetary-health.brown.edu/>. This supplements the broader institution's Office of Sustainability's website, [Sustainability at Brown](#), features relevant campus sustainability news, student-led efforts, interdisciplinary collaborations, global engagement, and opportunities to get involved. The website connects to IBES' website which further highlights environmental science research at the institution. Vivo.Brown.Edu is a comprehensive, searchable catalog of researchers and their interests/publications.

2.5. Has your institution recently hosted a conference or symposium on topics related to planetary health?

Yes, the **institution** has hosted at least one conference or symposium on topics related to planetary health in the past year. (4 points)

Yes, the **institution** has hosted at least one conference or symposium on topics related to sustainable healthcare/vetcare in the past year. (3 points)

Yes, the **institution** has hosted a conference on topics related to planetary health / sustainable healthcare/vetcare in the past three years. (2 points)

The **institution** has not hosted any conferences directly, but they have provided financial support for a local planetary health event. (1 point)

No, the **institution** has not hosted a conference on topics related to planetary health in the past three years. (0 points)

Score Assigned:

4

Score explanation: Brown's Office of Sustainability granted a seed grant to Dr. Alison Hayward, an emergency medicine attending to hold an in-person symposium at the medical school on Climate Change and Health in Spring 2024. This was a regional conference about solutions to address the health impacts of climate change, and it will occur again on May 1st of 2025.

2.6. Is your institution a member of a national or international planetary health or ESH/ESV organisation?

Yes, the institution is a member of a national or international planetary health **or** ESH/ESV organisation. (1 points)

No, the institution is **not** a member of such an organisation. (0 points)

Score Assigned:

1

Score explanation: The medical school is a part of both the Planetary Health Alliance and the Global Consortium on Climate and Health Education.

Section Total (14 out of 17)

82%

Back to Summary Page [here](#)

Community Outreach and Advocacy

Section Overview: *This section evaluates medical school engagement in community outreach and advocacy efforts associated with planetary health. Researching and teaching planetary health is necessary but not sufficient. It is critical that institutions also directly engage with communities most affected by environmental health harms. Although climate change is a problem largely created by those with power and resources, its impacts fall disproportionately on under-resourced populations and communities of colour. Institutions should partner with local communities affected by climate change and pollution to share information about environmental health threats, advocate together for change, and provide opportunities for students to be a part of this work.*

3.1. Does your **institution** partner with community organisations to promote planetary and health?

Yes, the **institution** meaningfully partners with **multiple** community organisations to promote planetary and environmental health. (3 points)

Yes, the **institution** meaningfully partners with **one** community organisation to promote planetary and environmental health. (2 points)

The **institution** does not partner with community organisations, but has participating in community focused events relating to planetary health. (1 point)

No, there is **no** such meaningful community partnership. (0 points)

Score Assigned:

3

Score explanation: The Warren Alpert Medical School partners with the Providence Neighborhood Planting Program (pnpp.org) and Farm Fresh Rhode Island (farmfreshri.org). PNPP works closely with the City of Providence to develop green spaces within the city through planting trees, and Farm Fresh RI works to reduce food waste and increase accessibility to locally sourced foods. Brown medical students had two opportunities, in the spring of 2024 and again in the fall of 2024, to attend neighborhood tree planting events. Outside of the medical school, there are other opportunities offered through Brown University, such as Clean Break, where items that are going to be thrown away by students are donated to the Providence community. On the community partnerships and volunteering portal "Brown Engage," there are additional community partners in which Brown students have volunteered in the past that are related to planetary health initiatives. However, these partnerships are through Brown University and not the Warren Alpert Medical School. The Planetary Health Elective encourages students to volunteer with various climate-oriented community organizations of personal interest and develop their own longitudinal relationships with these groups.

3.2. Does your **institution** offer community-facing courses or events regarding planetary health?

The **institution** offers community-facing courses or events at least once every year. (3 points)

The **institution** offers courses or events open to the community at least once per year, but they are not primarily created for a community audience. (2 points)

The **institution** has promoted community-facing courses or events, but was not involved in planning those courses or events. (1 point)

The **institution/medical school** have not offered such community-facing courses or events. (0 points)

Score Assigned:

0

Score explanation: The Planetary Health Preclinical elective now has a required community service learning component, which encourages local partnerships and community engagement. Approved community partners for required service for all medical students include groups such as the Providence Neighborhood Planting Program, Save the Bay, and others working towards planetary health in the local area

3.3. Does your **institution** have regular coverage of issues related to planetary health and/or sustainable healthcare in university update communications?

Yes, all students **regularly** receive communication updates dedicated to planetary health and/or sustainable healthcare. (2 points)

Yes, planetary health and/or sustainable healthcare topics are regularly included in communication updates to **some courses**. (1 point)

Students **do not** receive communications about planetary health or sustainable healthcare. (0 points)

Score Assigned:

1

Score explanation: The medical school has a dedicated Planetary Health website (<https://planetary-health.brown.edu/>). On that webpage, the school's education, impact, and innovation are highlighted to the public. There is regular coverage of issues related to planetary health to come through the website. On the news portion of the medical school website, there are occasionally articles and public events advertising regarding planetary health. Additionally, Today@Brown is a newsletter sent out to students and Brown community members which occasionally advertises planetary health events.

3.4. Does the **institution** or **main affiliated hospital trust** engage in professional education activities targeting individuals post graduation with the aim of ensuring their knowledge and skills in planetary health and sustainable healthcare remain up to date during their professional career?

Yes, the **institution** or **main affiliated hospital trust** offers multiple in-person or online courses relating to planetary health and/or sustainable healthcare for post-graduate providers, including at least one with a primary focus of planetary health. (2 points)

Yes, the institution or main affiliated hospital trust offers one course relating to planetary health and/or sustainable healthcare for post-graduate provider. (1 point)	
There are no such accessible courses for post-graduate providers. (0 points)	
Score Assigned:	0
<i>Score explanation: In 2024, the Warren Alpert Medical School and affiliated hospitals did not offer any continuing medical education courses related to planetary health or sustainable healthcare. The Warren Alpert Medical School of Brown University CME catalog and Brown University HealthCME catalog were searched with the queries “planetary health,” “climate change,” and “environmental health,” and no courses could be found. However, efforts are currently underway to establish an Emergency Medicine fellowship in climate change and health, as well as asynchronous open-access courses on planetary health to be piloted in EM, pediatrics, IM, and FM departments and then later opened up to all departments at Brown, and then eventually other institutions as well.</i>	

3.5. Does your <u>institution</u> or its <u>affiliated teaching hospitals</u> have accessible educational materials for patients about environmental health exposures?	
Yes, the medical school or all affiliated hospitals have accessible educational materials for patients. (2 points)	
Some affiliated hospitals have accessible educational materials for patients. (1 point)	
No affiliated medical centres have accessible educational materials for patients. (0 points)	
Score Assigned:	1
<i>Score explanation: There are no online resources about environmental health exposures available for patients on the medical school website. There was a free public online lecture on lead poisoning through the Brown University Health Community Health Ambassador series in January 2023, however the recording is not very easily accessible through online searching. Brown University Health is the medical school’s hospital system affiliate. According to physicians, some of the affiliated hospitals have provided educational materials for patients.</i>	

3.6. Does your <u>institution</u> or its <u>affiliated teaching hospitals</u> have accessible educational materials for patients about the health impacts of climate change?	
Yes, the medical school or all affiliated hospitals have accessible educational materials for patients. (2 points)	
Some affiliated hospitals have accessible educational materials for patients. (1 point)	
No affiliated hospitals have accessible educational materials for patients. (0 points)	
Score Assigned:	1

Score explanation: There is a recorded lecture on Brown University Health's Youtube account (which is the primary affiliate) through the Brown University Health Community Health Ambassador's lecture series on emergency preparedness in the context of climate change, however it is hard to find through online searching and not easily accessible. There are a lot of great community handouts on climate change on the Rhode Island Department of Health [website](#). It would be great if the Warren Alpert Medical school and its hospital affiliates could help distribute these.

Section Total (8 out of 14)

57%

Back to Summary Page [here](#)

Support for Student-Led Planetary Health Initiatives

Section Overview: *This section evaluates institutional support for student-led planetary health initiatives, such as funding, fellowships, programming, and student groups. Planetary health is a young field and, as young people facing a future deeply shaped by climate change, students are often some of the first at an institution to engage with it. Institutions should provide support for students to engage in sustainability quality improvement (QI) initiatives, discover mentors in their area of interest, and receive funding for planetary health projects.*

4.1. Does your <u>institution</u> offer support for students interested in enacting a sustainability initiative/QI project?	
Yes, the institution <i>either</i> offers grants for students to enact sustainability initiatives/QI projects <i>or</i> sustainability QI projects are part of the core curriculum. (2 points)	
The institution encourages sustainability QI projects (to fulfil clerkship or longitudinal requirements) and offers resources to help students succeed in these projects, but there is no student funding available and there is no requirement to participate. (1 point)	
No, neither the medical school or the institution offer opportunities or support for sustainability initiatives or QI projects. (0 points)	
Score Assigned:	2
<p><i>Score explanation: Since 2019, a student-led initiative has driven composting and single-stream recycling maintenance at the medical school buildings and affiliate sites, funded by the medical school and managed by the Brown Facilities Department. This demonstrates the administration's support for sustainability efforts originating from the student community.</i></p> <p><i>The Office of Sustainability and The Climate Solutions Initiative offers Sustainability Seed Grants to “provide faculty, students, and staff with opportunities to advance sustainability research, teaching and community engagement while contributing to Brown's sustainability goals as articulated in the University Sustainability Strategic Plan.”</i></p>	

4.2. Does your <u>institution</u> offer opportunities for students to do research related to planetary health and/or sustainable healthcare/vetcare?	
The institution has a specific research program or fellowship for students interested in doing planetary health/sustainable healthcare/vetcare research. (2 points)	
There are research opportunities for students to perform research related to planetary health/sustainable healthcare, but these require student initiative to seek these out and carry them out in their spare time. (1 point)	
There are no opportunities for students to engage in planetary health/sustainable healthcare research. (0 points)	
Score Assigned:	2

Score explanation: Similar to prior years, medical students at Brown are eligible to apply for the Ruth Sauber Medical Education Fund in Planetary Health. This funded opportunity involves a one year experience where students conduct faculty-mentored research on a topic in planetary health under the guidance of a faculty mentor. Students may apply for funded summer research assistantships where they conduct planetary health focused research; however, this funding is not limited to this domain. Beyond the medical school, the institution's Office of Sustainability supports competitive applications for seed grants that focus on sustainable research. The new scholarly concentration in Planetary Health provides additional support for students conducting research in the field.

4.3. Does the institution have a webpage where students can find specific information related to planetary health and/or sustainable healthcare/vetcare activities and mentors within the institution? For example, projects achieved, current initiatives underway at the medical school and/or contact of information of potential mentors.

The institution has a webpage with specific information related to planetary health or sustainable healthcare/vetcare that includes up-to-date information on relevant initiatives and contact information of potential mentors. (2 points)

There is an institution webpage that features some information on projects and mentors within planetary health and sustainable healthcare within the medical school, but it lacks key information. (1 point)

There is **no institution** specific webpage for locating planetary health and/or sustainable healthcare projects or mentors. (0 points)

Score Assigned:

2

Score explanation: With the new Planetary Health Scholarly Concentration, a list of mentors who work in the field of planetary health is posted on the scholarly concentration website (<https://education.med.brown.edu/scholarly-concentrations-program/planetary-health>).

4.4. Does your institution have registered student groups dedicated towards fostering a culture of planetary health engagement, scholarship, and advocacy on campus, supported by faculty advisors?

Yes, there is a student organisation **with faculty support** at my medical school dedicated to planetary health or sustainability in healthcare. (2 points)

Yes, there is a student organisation at my medical school dedicated to planetary health or sustainability in healthcare but it **lacks faculty support**. (1 point)

No, there is **not** a student organisation at my institution dedicated to planetary health or sustainability in healthcare. (0 points)

Score Assigned:

2

Score explanation: For several years, the ECo club has existed at the medical school as a student-run group that promotes the intersection of health and environment. It is funded by the medical school and receives support from faculty advisors Drs. Kyle Martin and Kate Smith. . The Planetary Health Curricular Integration Committee sought to integrate planetary health into the preclinical curriculum.

4.5. Is there a student liaison representing sustainability interests who serves on a department or institutional decision-making council to advocate for curriculum reform and/or sustainability best practices?

Yes, there is a student representative that serves on a department or institutional decision-making council/committee. (1 points)

No, there is no such student representative. (0 points)

Score Assigned:

1

Score explanation: The newly established Planetary Health Initiative at Brown University has a steering committee consisting of faculty and physicians from different domains across the Biomed division at the university in addition to one medical student, one PhD student, and two undergraduate students. This committee was formed to direct future sustainability efforts across disciplines.

4.6. In the past year, has the <u>institution</u> had one or more co-curricular planetary health programs or initiatives in the following categories? (1 point each)	Score
Projects where students are able to gain experience in organic agriculture and sustainable food systems, such as gardens, farms, community supported agriculture (CSA), fishery programs, or urban agriculture projects.	1
Panels, speaker series, or similar events related to planetary health that have students as an intended audience.	1
Events in which students 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.	0
Cultural arts events, installations or performances related to planetary health that have students as an intended audience.	0
Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts.	1
Wilderness or outdoors programs (e.g., that organise hiking, backpacking, kayaking, or other outings for students)	1
Score Assigned:	4

Score explanation: The Brown Market Shares Program offers a weekly supply of locally and sustainably sourced produce, dairy, eggs, and meat for students and other members of the Brown Community. There is a subsidy available to medical students to improve affordability.

There have not been any institutionally sponsored initiatives where students can learn about environmental justice from local organizations and activists, nor have there been cultural or artistic events relating to planetary health.

There was an opportunity to volunteer with the Providence Neighborhood Tree Planting Program in planting trees around Providence. Plans are underway to collaborate again this Spring.

A pre-clinical elective “Wilderness Medicine” was offered to medical students in the fall of 2023. The Brown Outing Club (BOC) is a University-wide student group that conducts outdoor trips, both local and regionally. They offer outing gear that can be rented for a subsidised price and have a no-questions asked financial aid policy for joining their trips.

Section Total (13 out of 15)	86%
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Back to Summary Page [here](#)

Campus Sustainability

Section Overview: This section evaluates the support and engagement in sustainability initiatives by the institution. The healthcare industry is a major contributor to greenhouse gas emissions as well as pollution that harms local, regional, and global ecosystems. While healthcare is, by nature, a resource-intensive endeavour, the healthcare sector is well poised to lead the world to a more sustainable future. This will involve scrutinising every aspect of how our systems operate, from where we source our energy, to how we build our infrastructure, to what companies we invest in. Our medical schools, clinics, and hospitals must set the standard for sustainable practices, and show other sectors what is possible when it comes to minimising environmental impact.

5.1. Does your <u>institution</u> have an Office of Sustainability?	
Yes, there is an Office of Sustainability with multiple full-time staff dedicated to campus sustainability. If the Office of Sustainability serves the entire campus, there is at least one designated staff member for sustainability at the hospital. (3 points)	
There is an Office of Sustainability with one or more full-time staff dedicated to campus sustainability, but no specific staff member in charge of hospital sustainability. (2 points)	
There are no salaried sustainability staff , but there is a sustainability task force or committee. (1 point)	
There are no staff members or task force responsible for overseeing campus sustainability. (0 points)	
Score Assigned:	2
Score explanation: Brown University maintains an active Office of Sustainability with eight full time staff members and several undergraduate interns. There is no specific staff member assigned to the medical school and/or affiliated hospitals.	

5.2. How ambitious is your <u>institution's</u> plan to reduce its own carbon footprint?	
The institution has a written and approved plan to achieve carbon neutrality by 2030 (5 points)	
The institution has a written and approved plan to achieve carbon neutrality by 2040 (3 points)	
The institution has a stated goal of carbon neutrality by 2040 but has not created a plan to reach that goal or the plan is inadequate (1 point)	
The institution/medical school does not meet any of the requirements listed above (0 points)	
Score Assigned:	3
Score explanation: Brown University (including the medical school) is not currently carbon neutral. However, Brown's sustainability plan proposes to achieve carbon neutrality by 2040 with a 75% reduction by 2025 via carbon offset, renewable natural gas offset, renovation of the main	

campus heat generation plant, and construction of net-zero buildings. This carbon offset will be achieved through investment into a Texan wind farm and a Rhode Island-based solar farm.

5.3. Do buildings/infrastructure used by the institution for teaching (not including the hospital) utilize renewable energy?

Yes, institution buildings are **100%** powered by renewable energy. (3 points)

Institution buildings source **>80%** of energy needs from off-site and/or on-site renewable energy. (2 points)

Institution buildings source **>20%** of energy needs from off-site and/or on-site renewable energy. (1 point)

Institution buildings source **<20%** of energy needs from off-site and/or on-site renewable energy. (0 points)

Score Assigned:

3

Score explanation: The medical school building does not have any on-site renewable energy sources and is supplied by the ISO-New England grid, a part of the Eastern interconnection grid. In 2023, an initiative was launched to install blade light controls within the building, which are programmed to shut off at 11:00 PM each night and stay off until sunset the following day. The building achieved LEED Gold at completion of its 2013 Renovation, with full LED conversion in 2017. Additional decarbonization measures such as converting the domestic hot water heaters from natural gas to electric resistance were implemented. The medical school building offsets all of its electricity use through solar RECs.

5.4. Are sustainable building practices utilised for new and old buildings on the institution's campus, with design and construction of new buildings and remodelling of old buildings conforming to a published sustainability rating system or building code/guideline?

Yes, sustainable building practices are utilised for new buildings on the institution's campus and the **majority** of old buildings **have been retrofitted** to be more sustainable. (3 points)

Sustainable building practices are utilised for new buildings on the institution's campus, but most old buildings have **not been retrofitted**. (2 points)

Sustainable building practices are **inadequately or incompletely** implemented for new buildings. (1 point)

Sustainability is **not considered** in the construction of new buildings. (0 points)

Score Assigned:

3

Score explanation: The medical school is housed in a renovated building that previously served as the headquarters of a jewelry manufacturing company. The building was completed in 2011 and

achieved a LEED Gold rating in 2013. The property's automation system undergoes continuous commissioning using analytics tools. In the future, alongside the construction of the new Integrated Life Sciences Building, the medical school building will transition to a district heating and cooling system, effectively eliminating the need for boiler operations.

5.5. Has the institution implemented strategies to encourage and provide environmentally-friendly transportation options for students and reduce the environmental impact of commuting?

Yes, the institution has implemented strategies to encourage and provide **environmentally-friendly transportation options** such as safe active transport, public transport, or carpooling and these options are well-utilised by students. Alternatively, the campus location is not amenable to unsustainable forms of transportation by default. (2 points)

The institution has implemented **some** strategies to provide environmentally-friendly transportation options, but the options are **unsatisfactorily** accessible or advertised. (1 point)

The institution has **not** implemented strategies to encourage and provide environmentally-friendly transportation options. (0 points)

Score Assigned:

2

Score explanation: The medical school generally discourages commuting to school via automobile, as students must pay for on campus parking or utilize metered street parking. Bus rides with the Rhode Island Public Transit Authority (RIPTA) system are free to all members of the Brown community via ID card. In recent years, the university's Office of Sustainability and Resiliency (OSR) conducted a review of medical student commuting behaviors and suggested the implementation of a carpooling network for students, expanded shuttle schedules, and added more secure and accessible bike storage. The university has since expanded shuttle service to the medical school and added additional bike racks beside the medical school building. Brown supports a partnership between the city of Providence and Spin Bikes/Scooters but has no financial stake in the partnership; the Office of Transportation does offer several resources including free bike repair through a community organization (Bikes at Brown). There is one unit with two electric vehicle charging ports at the medical student parking lot. Additionally, the OSR provides "Sustainability Tips" on their website, advising students on eco-friendly practices such as maintaining the proper PSI since low tire pressure increases fuel consumption and CO2 emissions.

5.6. Does your institution have an organics recycling program (compost) and a conventional recycling program (aluminium/paper/plastic/glass)?

Yes, the institution has **both** compost **and** recycling programs accessible to students and faculty. (2 points)

The institution has **either** recycling **or** compost programs accessible to students and faculty, but not both. (1 point)

There is **no** compost or recycling program at the medical school. (0 points)

Score Assigned:	2
<i>Score explanation: The medical school building has long standing aluminum, paper, plastic, and glass recycling programs. The medical school began implementing its composting program in 2019, which currently consists of composting bins in each of the three student lounges.</i>	

5.7. Does the <u>institution</u> apply sustainability criteria when making decisions about the campus food and beverage selections (e.g. local sourcing, reduced meat, decreased plastic packaging)?	
Yes, the institution has adequate sustainability requirements for food and beverages, including meat-free days or no red-meat, and is engaged in efforts to increase food and beverage sustainability. (3 points)	
There are sustainability guidelines for food and beverages, but they are insufficient or optional . The institution is engaged in efforts to increase food and beverage sustainability. (2 points)	
There are sustainability guidelines for food and beverages, but they are insufficient or optional . The institution is not engaged in efforts to increase food and beverage sustainability. (1 point)	
There are no sustainability guidelines for food and beverages. (0 points)	
Score Assigned:	1
<i>Score explanation: There has been no significant change to this since the last PHRC. There is one third party food vendor located within the medical school building. It is not required by the university to adhere to any food sustainability standards. The medical school utilizes Brown Dining's catering service for school sponsored events but does not participate in catering's "Green Event" option, which includes sustainably sourced food and reusable dining ware. Food is usually served in paper containers with plastic utensils, and food waste is composted. While Brown's Dining Services has food sourcing and sustainability goals, the medical school is not actively engaged in these efforts. Leftover food from events is frequently placed in student lounges to avoid food waste.</i>	

5.8. Does the <u>institution</u> apply sustainability criteria when making decisions about supply procurement?	
Yes, the institution has adequate sustainability requirements for supply procurement and is engaged in efforts to increase sustainability of procurement. (3 points)	
There are sustainability guidelines for supply procurement, but they are insufficient or optional . The institution is engaged in efforts to increase sustainability of procurement. (2 points)	
There are sustainability guidelines for supply procurement, but they are insufficient or optional . The institution is not engaged in efforts to increase sustainability of procurement. (1 point)	
There are no sustainability guidelines for supply procurement. (0 points)	
Score Assigned:	1

Score explanation: Brown University provides its departments with broad sustainability guidelines to steer their sourcing decisions. The university has banned the purchase of any furniture containing flame retardants, and GreenSeal and Eco certified cleaning products are used exclusively in all university buildings. The medical school does not have any specific sustainability criteria for the sourcing of its other materials.

5.9. Are there sustainability requirements or guidelines for events hosted at the institution?

Every event hosted at the institution **must** abide by sustainability criteria. (2 points)

The institution **strongly recommends or incentivizes** sustainability measures, but they are **not required**. (1 point)

There are **no** sustainability guidelines for institution events. (0 points)

Score Assigned:

1

Score explanation: There are no sustainability requirements or criteria for events hosted at the medical school. However, medical school staff do undertake measures to make events as paper-free as possible.

5.10. Does your institution have programs and initiatives to assist with making lab spaces more environmentally sustainable?

Yes, the institution has **programs** and **initiatives** to assist with making lab spaces more environmentally sustainable. (2 points)

There are **guidelines** on how to make lab spaces more environmentally sustainable, but not programs or initiatives. (1 point)

There are **no** efforts at the institution to make lab spaces more sustainable. (0 points)

Score Assigned:

2

Score explanation: Across Brown, an initiative to reduce lab ventilation during unoccupied periods was implemented. The medical school's anatomy lab ventilation optimization was completed in 2017. The labs of the medical building require 24/7 ventilation, but unoccupied ventilation rates were deemed satisfactory after inspection by an industrial hygienist. In addition, Brown has a laboratory ventilation management team that meets quarterly to review energy and safety initiatives. Lab ventilation standards have been developed and continued measures are being evaluated to reduce energy use from fume hoods and sash positions. There is also currently a student-led project underway to assess waste related to scalpel blade wrappers in the anatomy labs, which has increased general student awareness about medical waste and is an important step towards making the medical school's lab spaces more environmentally sustainable.

Section Total (22 out of 32)	69%
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Back to Summary Page [here](#)

Grading

Section Overview

This section focuses on the grading of the report card. The institution received a grade for each of the individual sections as well as an overall institutional grade. Section point totals were tallied, divided by the total points available for the section, and converted to a percentage. The overall institutional grade is a weighted average of the section grades, with curriculum receiving a higher weight owing to its larger number of metrics. Letter grades for each section and the institution overall were then assigned according to the table below.

Letter Grade*	Percentage
A	80% - 100%
B	60% - 79%
C	40% - 59%
D	20% - 39%
F	0% - 19%

**Within each grade bracket, a score in the top 5% (_5 to _9%), receives a “+”, and a score in the bottom 5% (_0- _4%) receives a “--”. For example, a percentage score of 78% would be a B+.*

Planetary Health Grades for the Warren Alpert Medical School of Medicine

The following table presents the individual section grades and overall institutional grade for the Warren Alpert Medical School of Medicine on this medical-school-specific Planetary Health Report Card.

Section	Raw Score %	Letter Grade
Planetary Health Curriculum (30%)	$(52/72) \times 100 = 72.22 \%$	B
Interdisciplinary Research (17.5%)	$(14/17) \times 100 = 82.35\%$	A-
Community Outreach and Advocacy (17.5%)	$(8/14) \times 100 = 57.14\%$	C
Support for Student-led Planetary Health Initiatives (17.5%)	$(13/15) \times 100 = 86.67\%$	A
Campus Sustainability (17.5%)	$(22/32) \times 100 = 68.75\%$	B
Institutional Grade	$(72.22 \times 0.3 + 82.35 \times 0.175 + 64.29 \times 0.175 + 86.67 \times 0.175 + 68.75 \times 0.175) = 74.53\%$	B

Report Card Trends

Section Overview

This graph demonstrates trends in overall and section grades for the years in which The Warren Alpert Medical School of Brown University has participated in the Planetary Health Report Card initiative.

