Planetary Health Report Card (Medicine):

University of Pennsylvania

2024-2025 Contributing Team:

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Land acknowledgment: We recognize and acknowledge that the University of Pennsylvania stands on the Indigenous territory known as “Lenapehoking,” the traditional homelands of the Lenape, also called Lenni-Lenape or Delaware Indians. These are the people who, during the 1680s, negotiated with William Penn to facilitate the founding of the colony of Pennsylvania. Their descendants today include the Delaware Tribe and Delaware Nation of Oklahoma; the Nanticoke Lenni-Lenape, Ramapough Lenape, and Powhatan Renape of New Jersey; and the Munsee Delaware of Ontario." - UPenn Association of Native Alumni

Summary of Findings

Overall Grade	B+

Curriculum	B

Though the University of Pennsylvania Perelman School of Medicine (PSOM) has made progress in integrating planetary health education, its inclusion remains inconsistent and primarily dependent on faculty champions and student-driven efforts. While planetary health topics are incorporated into preclinical courses such as "Doctoring," Health System Science, and select organ-system blocks, significant gaps remain, especially in the clinical years, where there is no required exposure to planetary health concepts. Topics such as the environmental consequences of medical interventions and sustainable healthcare practices are minimally covered.

Recommendations: PSOM should incorporate planetary health content longitudinally throughout the pre-clinical curriculum and also ensure integration into clinical training. Additional focus should be placed on sustainable clinical practice, environmental determinants of health, and planetary health-informed patient care.

Interdisciplinary Research	A

Penn has a strong foundation in planetary health research, with faculty conducting impactful work on climate-related health effects, environmental toxicology, and healthcare sustainability. The institution houses multiple centers supporting planetary health research, including the Center of Excellence in Environmental Toxicology (CEET). However, while there are opportunities for medical students to engage in planetary health research, structured programs specific to medical trainees remain limited.

Recommendations: PSOM should establish dedicated research fellowships or funding opportunities for students interested in planetary health. Expanding collaboration between medical faculty and researchers from other disciplines would further strengthen planetary health research efforts.

Community Outreach and Advocacy	A

Penn Medicine maintains partnerships with local environmental and community organizations, offering some opportunities for medical students to engage in environmental health-related initiatives. However, community- facing planetary health education remains limited. While Penn hosts public events such as Climate Week, there are no regular, free community-facing courses or outreach programs specifically focused on planetary health and healthcare sustainability.

Recommendations: PSOM should develop structured community outreach programs that educate patients and the broader Philadelphia community on climate-related health risks. Establishing formal partnerships with local environmental justice organizations could further expand advocacy efforts.

Support for Student-Led Initiatives	A

PSOM supports student-led planetary health initiatives through faculty mentorship and institutional funding opportunities such as the Green Fund and the Impact Fund. Multiple student organizations, including the Healthcare Sustainability Group and Philly T.R.E.E.S., actively work on climate and health issues. However, there is no centralized, easily accessible platform listing planetary health-related opportunities, projects, and mentors.

Recommendations: PSOM should create a centralized webpage or platform compiling planetary health resources, mentorship opportunities, and funding sources. Additionally, integrating sustainability quality improvement projects into the medical curriculum would further encourage student engagement.

Campus Sustainability	B-

Penn has made notable strides in campus sustainability, with a strong Office of Sustainability and commitments to carbon neutrality by 2042. The university sources a significant portion of its electricity from off-site solar energy and follows LEED certification standards for new buildings. However, not all older buildings have not been retrofitted for sustainability, and PSOM has no comprehensive plan for making its facilities, labs, and clinical spaces more environmentally sustainable.

Recommendations: PSOM should prioritize sustainable lab practices, expand composting and waste reduction programs, and ensure that all new and existing medical school buildings meet stringent environmental standards. Further efforts to incorporate sustainability into procurement and event planning should also be explored.

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 health professional 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 health professional training. It is imperative that we hold our institutions accountable for educating health professional 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, 4) community outreach centred on environmental health impacts, and 5) 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 health professional 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 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.

- **Extractivisim:** 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 medical school 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:	3
Score explanation: The Perelman School of Medicine (PSOM) offered two electives in the last year whose primary focus is ESH/planetary health, entitled Climate Change and Health (taught spring and fall 2024). The course is lecture-based, with speakers from Penn as well as other institutions, and challenges students to connect their basic science, clinical, and social knowledge to understand the impact of climate change on human health. Most sessions focus on the implications of climate change on conditions seen by different medical specialties, such as an endocrinologist giving a lecture on endocrine-disrupting chemicals and the impact of changing temperatures and air pollution on glycemic control and diabetes epidemiology. Student leaders within the climate movement at the Perelman School of Medicine are also invited to give lectures if they have a specific area of expertise or interest. Starting in 2023, the medical school also offers the OneHealth elective. This course focuses on the interconnectedness of people, animals, and the environment, and climate-related issues make up 5 out of the 9 total lectures. The following lectures in the OneHealth elective contain information regarding climate change: Introduction to OneHealth, Galápagos Education and Research Alliance (discussion of climate anxiety), Design for Health (sustainable design), Sustainable Development Goals, and Biodiversity.	

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

Score explanation: The core curriculum includes multiple integrations of climate change and health effects.

The MS1 core curriculum course "Doctoring" includes a session titled "Lived Environment." This session consists of a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health at the Perelman School of Medicine) followed by a 2-hour interactive small group discussion. This lecture includes extensive discussion of extreme heat, including rising temperatures and heat-related deaths in Philadelphia, vulnerable populations, urban heat islands, the importance of green spaces, and a description of Philadelphia's heat health emergency protocol. The small group session also instructed students to view the Philadelphia Heat Vulnerability Index map and discuss relationships between heat exposure and socioeconomic status. A required reading for the small-group session discussed the effect of extreme heat on health outcomes in Pennsylvania. While this lecture is in the core curriculum, attendance is not mandated for the plenary lecture – though it is recorded – while attendance is required for the small group.

Additionally, during the MS1 hematology block, they learn about the impact of extreme temperatures on sickle cell disease patients, particularly how extreme heat can precipitate vaso-occlusive episodes due to dehydration and increased blood viscosity, while cold temperatures induce VOEs through vasoconstriction., as well as how air pollutants, such as ground-level ozone, have also been found to trigger acute SCD exacerbations, as patients often have preexisting respiratory complications. Also, during the MS1 preclinical "Brain and Behavior" block in the core curriculum, there is brief discussion of Uhthoff's phenomenon (worsening symptoms of demyelinating diseases due to extreme heat). During the MS2 preclinical Renal block, supplemental/self-study material is provided covering renal implications of climate change and the effect of planetary health on patients with kidney disease.

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:	3

Score explanation: The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session consists of a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine) followed by a 2-hour interactive small group discussion. This lecture includes extensive discussion of extreme weather events, including heat waves, cold waves, wildfires, flooding, tornadoes, and hurricanes. The health effects of flooding are covered in depth, including waterborne pathogens, mental health effects, and disruptions in access to care. The lack of infrastructure to cope with these extreme weather events is also discussed, as well as the combined sewage system in Philadelphia that can result in sewage contamination of local waterways in the event of a flood. One of the listed required readings for the small-group session also discussed the effect of severe floods on air/water quality and emergency services in Pennsylvania. Please note that while this session is a part of the core curriculum, attendance is not mandated for the lecture but is recorded for the small group. Additionally, during the MS2 preclinical Endocrine block, there is provided supplemental/self-study material discussing how extreme weather affects patients with diabetes.

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: The medical curriculum addresses the effects of climate change on infectious diseases in multiple lectures. For example, in the Hemolytic Anemia lecture as part of hematology, students learn how climate change has led to increased malarial infections, and consequently, increased malarial anemia. The CNS Infections lecture in their Brain and Behavior course also discusses how climate change is expanding the range of disease vectors such as mosquitoes and ticks, leading to a rise in cerebral malaria, West Nile virus, Zika virus, and tick-borne encephalitis. The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session consists of a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine) followed by a 2-hour interactive small group discussion. In this lecture, there are slides on the increased range of the vector for lyme disease, as well as the increased length of tick season. Additionally, there are slides on the impact of climate change on waterborne illnesses, with emphasis on enteric viruses and bacteria. One of the listed required readings for the small-group session also the impact of climate change on increased rates of mosquito-borne and tick-borne infections. The effects of climate change on the spread of Lyme disease is also covered in two slides in a lecture titled "Infectious Arthritis" within the "Mechanisms of Disease and Therapeutic Intervention (MDTI)" block of the first-year, preclinical curriculum. These slides discuss how warming temperatures increase the range of tick habitat and thus drive the spread of Lyme. Additionally, the preclinical microbiology course includes a lecture titled "Parasitology" with one slide on the effects of climate change on the spread of malaria. Lastly, the "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on Infectious Diseases.

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: The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session includes a 2-hour interactive small group discussion on the health effects of climate change. One of the listed required readings for the small-group session discusses the impact of climate change on worsened air quality and increased rates of asthma in Pennsylvania, as well as longer and more severe allergy seasons. There is also content on climate change and air pollution specifically within the Philadelphia community during the Health System Science course as part of the MS4 core curriculum. Additionally, the preclinical MS2 pulmonary block includes a lecture on Environmental Exposures, covering basic mechanisms of particulate clearance in the lung, the components of a thoughtful occupational history, and a few common occupational/environmental lung diseases. During the MS2 preclinical Endocrine block, there is provided supplemental/self-study material discussing the connection between air pollution and diabetes, hypothyroidism, and pregnancy. Lastly, the "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on the relationship between climate change and the pulmonary system.	

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 points)	
Score Assigned:	3
Score explanation: Dr. Farah Hussain's lecture in the second-year "Health Systems Sciences" course touches upon the cardiovascular impacts of climate change, focusing on the relationship between air pollution and atherosclerotic disease. The specific impact of increased heat on cardiovascular health is not mentioned. The "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on the relationship between climate change and cardiology. Additionally, in the students hematology block, the Ischemic Stroke lecture highlights that temperature extremes (both heat and cold) are associated with an increased risk of stroke-related mortality. Cold temperatures can lead to vasoconstriction and hypertension, while heat can cause	

dehydration and hypercoagulability, both of which increase stroke risk. It also brings up how long-term exposure to air pollution (PM2.5, NO2, CO, SO2) is also associated with a greater likelihood of carotid artery stenosis and stroke-related mortality.

1.7. Does your <u>medical school</u> 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 point)	
This topic was **not** covered. (0 points)	
Score Assigned:	3
Score explanation: The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session includes a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine). In this lecture, there is a slide on the health effects of flooding, one of which is mental health effects. Additionally, during the MS1 preclinical "Brain and Behavior: block in the core curriculum, there is brief discussion of Uhthoff's phenomenon (i.e. worsening symptoms of demyelinating diseases due to extreme heat) as well as climate related mental health effects (climate anxiety, post-disaster PTSD). Also during this block, the Dementia lecture highlights that individuals with dementia face heightened risks of heat-related illnesses due to impaired thermoregulation. It discusses a study that found that a 1.5°C increase in mean summer temperature correlated with a 12% increase in dementia-associated hospital admissions. Air pollution exposure has also been linked to increased dementia risk due to microglial activation and impaired neurogenesis. Additionally, the Depressive Disorders & Suicide lecture incorporates data from a 2018 study in *Nature*, which found a 0.7% increase in suicide rates for every 1°C rise in monthly average temperature. By 2050, climate change is projected to cause an estimated 14,020 excess suicides in the U.S.	

1.8. Does your <u>medical school</u> 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:	1
Score explanation: During the MS2 preclinical Endocrine block, there is provided supplemental/self-study material discussing how food insecurity is associated with diabetes.	

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 points)	
Score Assigned:	3

Score explanation:

The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session consists of a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine) followed by a 2-hour interactive small group discussion. In this lecture, there is discussion of vulnerable populations especially in the context of extreme heat and lack of green spaces, including the elderly, low-income populations, and communities of color. In the small group session, there is a discussion point instructing students to use a structural competency framework to brainstorm policies, economic systems, and social hierarchies that contribute to the environmental exposures that influence health disparities. Additionally, there is a discussion on intersectionality and how climate change fits into this framework.

Dr. Hussain's lecture in the "Health Systems Sciences" course also briefly touched upon the disproportionate impact of poor air quality and increased asthma prevalence in communities with lower socioeconomic status.

Additionally, during MS1s hematology block, the Iron Deficiency lecture covers how increased CO2 emissions reduce the iron content in staple crops, disproportionately affecting populations in South Asia, the Middle East, East Africa, Southeast Asia, and North Africa—regions already facing high rates of anemia. During MS1s' Brain and Behavior course, the Climate Change and Anxiety lecture further highlights that eco-anxiety is most prevalent in regions experiencing firsthand climate-related devastation.

Lastly, the "Climate Change and Health Elective" offered to medical students every semester discusses populations most vulnerable to climate-related health effects throughout the course.

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
Score explanation: During MS1's hematology block, the Iron Deficiency lecture covers how increased CO2 emissions reduce the iron content in staple crops, disproportionately affecting populations in South Asia, the Middle East, East Africa, Southeast Asia, and North Africa—regions already facing high rates of anemia. During MS1s' Brain and Behavior course, the Climate Change and Anxiety lecture further highlights that eco-anxiety is most prevalent in regions experiencing firsthand climate-related devastation. In Climate Change elective, there was discussion of changing infectious disease patterns.	

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
Score explanation: The "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on the relationship between climate change and reproductive health. In addition, in the Reproduction course taken in the M1 year, students are encouraged – though not required – to self-study topics, one of which is the connection between air pollution and pregnancy. The Ischemic Stroke lecture highlights that temperature extremes (both heat and cold) are associated with an increased risk of stroke-related mortality. Cold temperatures can lead to vasoconstriction and hypertension, while heat can cause dehydration and hypercoagulability, both of which increase stroke risk. Long-term exposure to air pollution (PM2.5, NO2, CO, SO2) is also associated with a greater likelihood of carotid artery stenosis and stroke-related mortality.	

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

Score explanation: The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session consists of a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine) followed by a 2-hour interactive small group discussion. This lecture includes discussion of extreme heat and heat-related deaths specifically in Philadelphia, a description of Philadelphia's heat health emergency protocol, and discussion regarding the combined sewage system in Philadelphia that can result in contamination of local waterways in the event of a flood. The small group session also instructed students to view the Philadelphia Heat Vulnerability Index map and discuss trends noted. One of the listed required readings for the small-group session also discussed the effect of extreme heat, worsened air quality, and severe floods on health outcomes in Pennsylvania.

There is also content on climate change and air pollution specifically within the Philadelphia community during the "Health Systems Sciences" course. Dr. Hussain's lecture in this course explores the Philadelphia Energy Solutions Refinery fires, which caused considerable pollution, disproportionately in areas with more families of color or lower socioeconomic status.

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:	1

Score explanation: The Climate Change and Health elective curriculum included a case study on the intersection of climate change and food insecurity that covers Indigenous knowledge and value systems in the context of planetary health. Topics discussed include the role of traditional ecological knowledge in environmental stewardship and health, the impact of climate change on Indigenous food systems and subsistence practices, and the importance of culturally relevant healthcare approaches. The case study also explored how Indigenous communities observe and respond to environmental changes, as well as the significance of preserving traditional food sources for health and food security. Additionally, there is discussion on how healthcare providers can collaborate with Indigenous communities to incorporate local knowledge into patient care and public health initiatives.

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 points)	
Score Assigned:	2
Score explanation: This topic is covered in a lecture in the "Climate Change and Human Health" elective which focuses on environmental exposures, how to assess a patient's risk or sequelae of an exposure, and relevant treatment/lifestyle recommendations. During MS1s' Brain and Behavior course, the Climate Change and Anxiety lecture further highlights that eco-anxiety is most prevalent in regions experiencing firsthand climate-related devastation.	

Curriculum: Sustainability

1.15. Does your <u>medical school</u> 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:	0
Score explanation: This topic was not covered.	

1.16. Does your <u>medical school</u> 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 points)	
Score Assigned:	2
Score explanation: The preclinical core curriculum course "Doctoring" includes a session for MS1's titled "Lived Environment." This session includes a 1-hour lecture by Dr. Farah Hussain (Director of Planetary Health, Perelman School of Medicine). In this lecture, there are slides on the healthcare system's carbon footprint including the statistic that the healthcare system contributes to 1/10th of US	

greenhouse gas emissions, and if the US healthcare system were a country, it would rank 7th globally in terms of emissions.

Dr. Hussain's "Health System Sciences" lecture covered similar material regarding the outsized impact of healthcare on our changing climate, highlighting federal and international initiatives to reduce healthcare-related emissions.
Additionally, during the MS2 preclinical Renal block, self-study material was available covering the climate effects of kidney replacement therapies and mitigation strategies. Lastly, the "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on healthcare system sustainability.

The **Anesthetics** lecture highlights how anesthetic gases contribute significantly to greenhouse gas emissions. Desflurane, for example, is 2,540 times more potent than CO2 in terms of global warming potential. Penn Medicine is actively phasing out desflurane in operating rooms by the end of 2024, favoring sevoflurane, which has a lower environmental impact. Additionally, a low-flow anesthesia initiative at the Hospital of the University of Pennsylvania (HUP) has already reduced CO2 emissions by an estimated 30 metric tons.

1.17. Does your medical school curriculum cover these components of sustainable clinical practice in the core curriculum? (points for each)	**Score**
The health **and** environmental **co-benefits** of **avoiding** over-medicalisation, over-investigation and/or over-treatment (2 points)	0
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) .	0
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)	0
Environmental impact of **surgical** healthcare on planetary health and the climate crisis, and how can it be mitigated. (1 point)	0
The impact of **anaesthetic** gases on the healthcare carbon footprint and ways to reduce anaestheisa's environmental impacts, such as total intravenous anaesthesia or choosing less environmentally harmful anaesthetic gas options with reduced greenhouse gas emissions. (1 point)	1
The impact of **inhalers** on the healthcare carbon footprint and the environmental benefit of dry powdered inhalers over metered dose inhalers. (1 point)	0
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)	0
Score explanation: The Anesthetics lecture highlights how anesthetic gases contribute significantly to greenhouse gas emissions. Desflurane, for example, is 2,540 times more potent than CO2 in terms of global warming potential. Penn Medicine is actively phasing out desflurane in operating rooms by the end of 2024, favoring sevoflurane, which has a lower environmental impact.	

Additionally, a low-flow anesthesia initiative at the Hospital of the University of Pennsylvania (HUP) has already reduced CO2 emissions by an estimated 30 metric tons.

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:	1
Score explanation: The "Climate Change and Health Elective" offered to medical students every semester includes a dedicated lecture on talking to patients about climate change.	

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
Score explanation: The "Introduction to Clinical Medicine (ICM)" course in the core curriculum for second-year medical students includes some content on taking an environmental history, per slides created by students in 2021. Additionally, the ICM course includes content on taking a Climate Emergencies history. For this course, students have a pre-reading document that includes the following: "Exposures – The general exposure history includes the following: Environmental: chemicals, dusts, and fumes? Animal exposure (pets, livestock, lab animals)? Travel outside the country? Blood transfusions? When and why? These questions are usually generated as part of a symptom-triggered part of taking the history. You won't ask this a lot unless it seems clinically relevant."	

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
Score explanation: The University of Pennsylvania Perelman School of Medicine is currently in the process of making major improvements to planetary health education. We recently appointed Dr. Farah Hussain as Director of the Planetary Health Curriculum; her responsibilities include collaborating with PSOM faculty and staff to ensure that medical students are receiving instruction on the health effects of climate change and the disproportionate effects on disadvantaged communities.	

1.21. How well are the aforementioned planetary health/Education for Sustainable Healthcare topics integrated longitudinally into the <u>core</u> 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: Some planetary health/ESH topics are appropriately integrated into the core medical student curriculum. Planetary Health topics have been integrated in core lectures for Pulmonology, Brain and Behavior, Infectious Disease, Dermatology, ICM, and Health System Science courses. Supplemental material has been provided for the Renal and Endocrine courses. Core courses such as GI and Cardiology still lack key climate-related content. Additionally, there is a session in the "Doctoring" course titled "Our Lived Environment, Climate Consequences on Human Health" to prepare students to recognize climate change and its impacts on human health and disease, gain familiarity with the mechanisms by which climate change impacts the environment, and understand how vulnerable populations are disproportionately affected by the consequences of climate change. However, there is no mandatory incorporation of planetary health content in the clinical years. After the first 18 months of medical school, students have to purposefully opt in to electives or extracurriculars to continue learning planetary health content.	

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:	1
Score explanation: The Perelman School of Medicine recently appointed Dr. Farah Hussain as Director of the Planetary Health Curriculum. This faculty member's responsibilities include collaborating with PSOM faculty and staff to ensure that medical students are receiving instruction on the health effects of climate change and the disproportionate effects on disadvantaged communities.	

Section Total (50 out of 72)	**69.4%**

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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 institution?	
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

Score explanation: There are researchers affiliated with the University of Pennsylvania medical school who are conducting research related to planetary health. Many of these faculty members have extensive publications related to planetary health.

- Dr. Misha Rosenbach (dermatology) has researched the impact of climate change on skin conditions
    - Wang S-P, Stefanovic N, Orfali RL, et al. Impact of climate change on atopic dermatitis: A review by the International Eczema Council. Allergy. 2024;00:1-15. doi:10.1111/all.16007
    - Philadelphia study links tree canopy growth to decrease in human mortality. US Forest Service Research and Development. (2023, September 1).
- Dr. Gregory Tasian (nephrology) has studied the relationship between population density and temperature affect the transmission of SARS-CoV-2

○ The Association of Social Distancing, Population Density, and Temperature with the SARS-CoV-2 Instantaneous Reproduction Number in Counties Across the United States. David Rubin, Jing Huang, Brian T. Fisher, Antonio Gasparrini, Vicky Tam, Lihai Song, XiWang, Jason Kaufman, Kate Fitzpatrick, Arushi Jain, Heather Griffis, Koby Crammer, Gregory Tasian. medRxiv 2020.05.08.20094474; doi:https://doi.org/10.1101/2020.05.08.20094474

● Dr. Eugenia South (Emergency Medicine) has investigated ways to improve environment health justice ○ Ashcraft, L. E., Cabrera, K. I., Lane-Fall, M. B., & South, E. C. (2024). Leveraging implementation science to advance environmental justice research and achieve health equity through neighborhood and policy interventions. Annual Review of Public Health, 45(1). https://doi.org/10.1146/annurev-publhealth-060222-033003 ● Dr. Sameed Kahtana (cardiology), has recent papers on CV effects of climate change on marginalized communities ○ Khatana, S. A., Eberly, L. A., Nathan, A. S., & Groeneveld, P. W. (2023). Projected change in the burden of excess cardiovascular deaths associated with extreme heat by Midcentury (2036–2065) in the contiguous United States. Circulation, 148(20), 1559–1569. https://doi.org/10.1161/circulationaha.123.066017

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:	3
Score explanation: The Perelman School of Medicine holds the Center of Excellence in Environmental Toxicology (CEET) is a multidisciplinary resource for examining environmental health risks and exposures through the lens of environmental toxicology. Additionally, there exists the Institute for Environmental Medicine, a program that studies the cellular, biochemical, and molecular aspects of environmental issues through biomedical research.	

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:	2

Score explanation:

The Center of Excellence in Environmental Toxicology includes a Community Engagement Core in which community concerns are used to guide environmental research ideas. This is done by conducting interviews in affected communities. While this does not provide these communities direct decision-making power, they influence and shape the climate and environmental research agenda for this institution.

The Urban Health Lab, run by Dr. Eugenia South, functions as a community-academic collaborative with multiple initiatives to promote nature, prevent violence, and dismantle racism in its surrounding community.

2.4. Does your <u>institution</u> 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: Penn Sustainability has a robust website with details regarding campus initiatives, upcoming events, funding opportunities, and more. This website serves the entire university.
The Perelman School of Medicine has a website for students to explore and engage with projects related to climate change and sustainability in health care. However, it is not comprehensive and has not been updated recently. See item 4.3 for additional description.
https://www.med.upenn.edu/student/planetary-health-resources.html
https://www.sustainability.upenn.edu/campus-initiatives/wellness
https://environment.upenn.edu/

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: The University of Pennsylvania hosts Climate Week which hosts several symposiums on the various forms and effects of climate change. This will be hosted in 2023 from September 19th to 22nd. https://climateweek.provost.upenn.edu/event-archive Additionally, Penn Vet's One Health Club hosts a symposium that provides interdisciplinary education and collaboration between the 12 graduate schools of the University of Pennsylvania. The week consists of lectures and discussions varying from current healthcare research to zoonotic disease outbreaks, topics related to planetary health. https://pennvetohc.wixsite.com/2019 In November 2024, the university also hosted a symposium "Climate Solutions for the Living World" which was a one-day symposium that showcased the diverse and interdisciplinary approaches at the University of Pennsylvania that focus on monitoring, understanding and effectively addressing changing climates, including challenges of urbanization and climate on water, food, air and health with a focus on the impact of climate change on urban health.	

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 Perelman School of Medicine is a member of the Global Consortium of Climate and Health Education. It is not a member of the Planetary Health Alliance.	

Section Total (16 out of 17)	**94.1%**

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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: Penn Medicine formally interfaces with multiple community organizations to promote planetary and environmental health through the Bridging the Gaps program. Students can take part in a Community Health Internship with community partners. Medical students can work with Sankofa Community Farm at Bartram's Garden, working with adolescents on the farm to increase knowledge/access to nutritious food. Students can also work with UC Green, which empowers environmental stewardship in University City and its surrounding communities. Additionally, the Perelman School of Medicine's student organization "Philly T.R.E.E.s (Towards Racial and Environmental Equity) focuses on environmental justice to coordinate plantings and prunings with many community partners in the Philadelphia community Point Breeze, including Point Breeze Tree Tenders and they Philadelphia Horticultural Society.	

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** has not offered such community-facing courses or events. (0 points)

Score Assigned:	3

Score explanation: There are no free community-facing courses regarding climate change and the environment available at the University of Pennsylvania. However, there are a variety of events hosted by the University of Pennsylvania Office of Sustainability. A list of events can be found here.

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 Perelman School of Medicine Communications, Collaborations, and Community Update Express email is distributed monthly and includes a link to the medical school's Planetary Health website, which is linked here. Whenever new episodes of the podcast series "Code Green," which covers the intersection of climate and health, are published, these are sent by the medical school to the whole student body.

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:	2

Score explanation: The University of Pennsylvania and its affiliated institutions offer various professional education opportunities related to planetary health and sustainable healthcare, though most do not provide formal CME credits.

Several residency programs are beginning to integrate planetary health content into their training. Additionally, longitudinal educational series such as the One Health Research in Progress and EII Climate 101 are available to faculty, trainees, and staff. While these sessions help professionals stay updated, they do not currently offer CME credits.

Moreover, Penn Medicine hosts departmental talks, including grand rounds in specialties like radiology, which do provide CME credits for attendees.

The Center of Excellence in Environmental Toxicology (CEET) at Penn also offers advanced career training for early-stage investigators, focusing on environmental health and toxicology. https://ceet.upenn.edu/education-training/advanced-career-training/early-stage-investigators/

3.5. Does your institution or its affiliated teaching hospitals have accessible educational materials for patients about environmental health exposures?

Yes, the **institution** 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:	2

Score explanation: Yes, the University of Pennsylvania's Center of Excellence in Environmental Toxicology (CEET) offers accessible educational materials for patients concerning environmental health exposures. Through its Community Engagement Core, CEET has developed a variety of free resources that can be downloaded and shared. These materials cover topics such as lead exposure, air quality, and water quality. For instance, CEET provides brochures detailing the health effects of lead poisoning and methods to reduce exposure, as well as instructional content on collecting soil samples for lead testing. Additionally, CEET offers an environmental health curriculum designed to educate students about the importance of environmental health, thereby empowering communities to protect and improve their well-being.
https://ceet.upenn.edu/community/community-resources/

3.6. Does your institution or its affiliated teaching hospitals have accessible educational materials for patients about the health impacts of climate change?

Yes, the **institution** 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:	2

Score explanation: Yes, the University of Pennsylvania and its affiliated teaching hospitals, including the Children's Hospital of Philadelphia (CHOP), provide accessible educational materials for patients about the health impacts of climate change.

In September 2023, during Climate Week at Penn, CHOP hosted a panel discussion open to the public titled "Impacts of Heat on Health in Early Life." This event featured health experts who discussed the significant consequences of rising temperatures on human health, particularly focusing on the vulnerability of fetuses and newborns. The panel emphasized the urgency of collective action, including climate change mitigation efforts and robust public health policies, to combat the escalating threats posed by rising temperatures.

Additionally, CHOP offers a free online course titled "Climate Change and Children's Health," which provides an overview of the various ways climate change affects children's health, including prenatal health and mental health, and is designed to educate both healthcare providers and the general public. open.chop.edu

The hospital also provides two articles on the impact of climate change on health; one on climate change and headaches (linked here), and one on climate change and allergy season (linked here).

Lastly, in December 2024, Dr. Farah Hussain gave a lecture called “Climate Change and Human Health” as part of Environmental Innovations Initiative's Climate 101 series, which was open to the general public.

Section Total (13 out of 14)	**92.9%**

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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 institution offer support for students interested in enacting a sustainability initiative/QI project?	
Yes, the **institution** *either* offers grants for students to enact sustainability initiatives/QI projects *or* 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, the institution **does not** offer opportunities or support for sustainability initiatives or QI projects. (0 points)	
Score Assigned:	2

Score explanation: The University of Pennsylvania Sustainability Office offers the Green Fund from which students can receive funding for sustainability initiatives. This initiative is a source of funding for students, faculty, and staff that have ideas for projects to "improve the university's environmental performance and reduce campus emissions." This grant is not specific to the medical school and can result in up to $30,000 in funding. The grant is flexible insofar that applications are reviewed on a rolling basis and application support is offered through Penn Sustainability if applicants have questions or need assistance identifying University partners.

The Perelman School of Medicine Medical Student Government offers the Impact Fund, to which students can apply for a smaller "Jump Start Grant" or a "Big Deal Award." If a student wanted to design a planetary health initiative, it could potentially be funded through one of these grants, though neither is specific to the intersection of climate change and human health.

The Environmental Innovation Initiative has launched a program Integrating Sustainability Across the Curriculum (ISAC) which provides funding for course integration of climate change and sustainability. One medical student used this funding to develop slides for course directors to easily integrate into presentations. ISAC program information available here: https://environment.upenn.edu/integrating-sustainability-across-curriculum

The Department of Medicine recently awarded a $7,500 grant to a group of students to create an online student-facing, evidence-based online curriculum focusing on the intersection of climate change and health that is currently in development.

4.2. Does your institution offer opportunities for students to do research related to planetary

health and/or sustainable healthcare?	
The **institution** has a **specific** research program or fellowship for students interested in doing planetary health/sustainable healthcare 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: The University of Pennsylvania offers the Climate Leaders @ Penn fellowship for graduate and professional students. Each year, twenty students are selected as fellows, engaging in masterclasses and social events with climate leaders, and culminating in a capstone project. The fellowship is described as "tailoring educational, professional, and social initiatives that foster connections and knowledge-sharing across the entirety of the university." The mission of the fellowship is to "not only enhance the climate-related expertise within the Penn graduate community but also to empower both the fellows and the broader community to effectively address the pressing climate crisis." However, it is pertinent to understand that the fellowship is not a paid opportunity and does not result in any credit towards a student's degree. While medical students are eligible to apply to this opportunity, they would have to seek out specific mentors and opportunities to focus their fellowship on planetary health and sustainable healthcare.	

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 institution 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 institution, 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:	1
Score explanation: There is a medical school webpage that features information on planetary health resources. It includes links to funding sources, supplementary planetary health courses students may take at other Penn schools, and planetary health events on campus. None of the linked websites from that page are managed by the medical school.	

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 institution dedicated to planetary health or sustainability in healthcare. (2 points)	
Yes, there is a student organisation at my institution 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: There are multiple student groups at the Perelman School of Medicine that focus and work on planetary health issues with support from faculty advisors. These include the following: ● Healthcare Sustainability Group: This group of students is specifically dedicated to educating the PSOM community about the impact of the changing climate on human health, creating quality improvement initiatives to reduce waste and the overall environmental impact of our health practice, and engage in advocacy, patient education, and research focused on these topics. The faculty advisor for this group is Dr. Farah Hussain, the Director of Planetary Health Curriculum at the Perelman School of Medicine. ● Philly TREES: This student-run organization aims to improve tree equity and community wellness in Philadelphia. Philly TREES plants trees in Philadelphia in areas with disproportionately less tree canopy, which, by virtue of tree inequity in urban environments, tend to be underserved populations. Their work includes tree planting, tree care, community education and outreach, and student leadership development in health equity. ● One Health: The PennMed One Health Club is a student group raising awareness of and supporting interdisciplinary approaches to the health of humans, animals, and the environment. This group focused on advocacy, education, outreach, and research on One Health topics and helps foster such connections across Penn and the greater Philadelphia community.	

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: Two students serve as student representatives on the CIRCE Medicine committee. CIRCE:Medicine is a subcommittee of the University-wide Faculty Senate Select	

Committee on the Institutional Response to the Climate Emergency ("CIRCE"). We aim to increase the role of all healthcare providers across the University of Pennsylvania Health System (UPHS) and the Children's Hospital of Philadelphia (CHOP) in combating the climate crisis, in line with CIRCE's mission. Our group is specifically dedicated to taking action against climate change through the lens of healthcare – through its education, research, and advocacy – with the ultimate goal of decreasing the carbon footprint of our health system. Student reps present progress on student-led initiatives monthly at meetings and receive faculty support as needed.

4.6. In the past year, has the institution 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.	1
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 explanation:

Penn Farm is a campus farm and educational program that uses regenerative practices to grow produce in support of food access initiatives throughout the Penn community. Students across the institution can volunteer with the farm. *https://wellness.upenn.edu/penn-farm*

Climate Week at Penn offers opportunities for every member of the Penn community to learn about and act on the climate crisis. This included a talk "Pathways to a Climate and Health Career" targeted for students.

The University of Pennsylvania (Penn) has actively engaged students in cultural arts events and installations that address planetary health and climate change. Notable initiatives include:

- Earth Week at Penn: An annual event featuring over 30 activities, such as traditional storytelling, art-making, live music, and dance performances, culminating in a color throw. These events aim to educate and involve students in environmental issues. penntoday.upenn.edu
- Penn Climate Animation and Research Studio: A mobile animation studio involving six students in on-location research and animation in countries vulnerable to climate change. This immersive experience allows students to create art that informs policymakers and

communities about climate adaptation strategies.
design.upenn.edu

- "Risky Beauty: Aesthetics and Climate Change" Exhibition: Hosted by the Annenberg Public Policy Center in conjunction with the 2024 Society of Environmental Journalists Annual Conference, this exhibition challenges viewers to reconsider their aesthetic experiences of nature in the context of climate change.
  asc.upenn.edu

Philly TREEs (Philadelphia Towards Racial and Environmental Equity) is a student group at PSOM dedicated to addressing disparities in greenspace access and advocating for expanding our urban tree canopy in Philadelphia. They lead regular tree planting activities in the community.

PSOM has a Wilderness and Disaster Medicine Course that consists of one week of didactics and skills-based training, and a second week of full-time camping and field exercises.

Section Total (13 out of 15)	**86.7%**

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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 institution 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:	3
Score explanation: The University of Pennsylvania (Penn) has a dedicated Office of Sustainability with multiple full-time staff members overseeing campus-wide environmental initiatives. Greg Evans serves as corporate director of sustainability for the University of Pennsylvania Health System.	

5.2. How ambitious is your institution's 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 does **not** meet any of the requirements listed above (0 points)	
Score Assigned:	1
Score explanation: Penn is committed to campus carbon neutrality by 2042, and it has a clear action plan. https://sustainability.upenn.edu/campus-initiatives/climate-energy	

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:	1
Score explanation: In April 2020, Penn signed a Power Purchase Agreement (PPA) to procure energy from two solar energy facilities with a combined capacity of 220 megawatts. These facilities, operational since December 2023, are designed to supply approximately 75% of the university's total electricity demand, encompassing both academic and healthcare campuses. smartenergydecisions.com	

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 University of Pennsylvania employs sustainable building practices for both new constructions and renovations on its campus, adhering to recognized sustainability rating systems. Penn has committed to achieving at least LEED Silver certification for all new construction and major renovation projects. LEED (Leadership in Energy and Environmental Design) is a globally recognized green building certification system developed by the U.S. Green Building Council, focusing on promoting sustainable and energy-efficient building practices. Penn has undertaken numerous retrofitting projects to enhance the energy efficiency and sustainability of its older buildings. While not all historic structures have been retrofitted, many have. The Pavillion, Penn Medicine's newest hospital building opened in 2021, and the Perelman Center for Advanced Medicine, where the medical school is located, are LEED certified (gold and silver, respectively).	

All future Penn Medicine buildings and renovation projects are registered with the USGBC and aiming for at least a LEED silver certification. In the construction of the Pavillion, sustainable practices included recycling material from the demolition of Penn Tower which previously occupied the Pavillion's spot, installing a HVAC system that utilizes 100% outside air, and reducing water usage through low-flow sinks, toilets and showers. The Hospital of the University of Pennsylvania works with Student Eco-Reps to record improvements in energy efficiency at the hospital. Lastly, the Perelman School of Medicine has construction standards outlined here and furniture standards outlined here.

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:	1
Score explanation: The University of Pennsylvania offers a free on-demand evening shuttle service for students (7:30pm-3am). In addition, 4 electric vans were added to the University's transit fleet offered by the Penn Parking and Transportation unit. Many students bike to school, and 352 bike parking spots were added when The Pavillion was opened. The University of Pennsylvania is considered a Bike Friendly University. While some students do utilize these resources, they are not widely-used. Correction from 2024 report card: public transportation benefits listed in the 2024 report card are not available to students and are just for employees.	

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 institution. (0 points)	
Score Assigned:	2
Score explanation:	

Conventional Recycling: Penn employs a single-stream recycling system, allowing materials such as paper, cardboard, plastics, glass, and metals to be collected together. This approach simplifies the recycling process for the campus community. The university provides resources, including printable signage and maps, to guide proper recycling practices. facilities.upenn.edu

Organics Recycling (Composting): Penn has implemented composting initiatives, particularly within its dining facilities. These programs focus on diverting food waste from landfills by collecting organic materials for composting. For instance, the university composts approximately 150 tons of food waste annually from its cafeterias, resulting in cost savings and environmental benefits. phlcouncil.com

While these programs are in place, there have been calls from the university community to expand composting efforts. Some students have advocated for the introduction of more composting stations across campus to further reduce organic waste and enhance sustainability practices. thedp.com

5.7. Does the institution 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 a**dequate s**ustainability 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:	2

Score explanation:
Penn's dining services, managed by Bon Appétit Management Company, prioritize purchasing food that is sustainably and ethically produced. This includes sourcing rBGH-free milk and yogurt, humanely raised beef and pork, poultry raised without routine antibiotics, cage-free eggs, and seafood that meets the Monterey Bay Aquarium's Seafood Watch sustainability guidelines. reports.aashe.org

Catering@Penn Platform: Developed collaboratively by Penn Procurement Services and Penn Sustainability, this platform assists the university community in selecting caterers who align with sustainability and inclusivity goals. It enables users to search for diverse providers based on specific catering needs and sustainability preferences, promoting environmentally friendly and socially responsible catering choices. sustainablepurchasing.org

Sustainable Café Operations: Campus cafés, such as Joe's Café, operate under contracts that include sustainability requirements. These encompass waste reduction through composting and recycling, sustainable food purchasing, staff training on eco-friendly practices, and educational events. Joe's Café earned a LEED Innovation in Design credit for its sustainable operations. reports.aashe.org

5.8. Does the institution 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:	2
Score explanation: The University of Pennsylvania applies sustainability criteria in its supply procurement processes. The university's commitment to environmentally responsible purchasing is outlined in its sustainable procurement policies, which guide purchasing decisions across various commodity categories. These policies emphasize the selection of products and services that have a reduced environmental impact throughout their life cycle. reports.aashe.org In practice, Penn incorporates Life Cycle Cost Analysis (LCCA) when evaluating energy- and water-using products and systems. This approach considers the total cost of ownership, including initial costs, operation, maintenance, and disposal, to ensure that procurement decisions are both economically and environmentally sound. reports.aashe.org Additionally, Penn's Supplier Diversity & Inclusion Program promotes engagement with local, minority-owned, LGBTQ+, women-owned, veteran-owned, and disability-owned businesses. This initiative aligns with the university's values by fostering an inclusive supply chain that supports the local economy and reflects Penn's commitment to social responsibility. sustainability.upenn.edu	

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: The Penn Sustainability Office developed the Green Event Guide to assist students, faculty, and staff in organizing environmentally friendly events. This comprehensive guide offers recommendations for all stages of event planning, including pre-event preparations, the event itself, and post-event cleanup. Key suggestions from the guide include:	

- Venue Selection: Opt for locations with natural lighting to reduce energy consumption and spaces accessible via public or alternative transportation modes.
- Resource Management: Minimize paper usage by promoting digital materials and utilize reusable or recyclable service ware to decrease waste.
- Catering Choices: Partner with sustainable caterers who prioritize eco-friendly practices.
- Waste Disposal: Ensure the availability of recycling and composting receptacles, accompanied by clear signage to guide attendees.

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: Green Labs Program: This initiative aims to improve safety and sustainability by educating and empowering lab staff on best practices. A collaborative effort between the Office of Environmental Health and Radiation Safety and the Penn Sustainability Office, the program provides resources and guidance to promote sustainable lab operations. sustainability.upenn.edu Green Labs Guide: Developed by Penn Sustainability, this guide outlines daily, monthly, and annual actions that lab personnel can implement to reduce environmental impact. It serves as a comprehensive resource for integrating sustainability into laboratory practices. reports.aashe.org	

5.11. Does your institution's endowment portfolio investments include fossil-fuel companies?
The institution is **entirely divested** from fossil fuels **and** has made a **commitment to reinvest divested funds** into renewable energy companies or renewable energy campus initiatives. (4 points)
The institution is **entirely divested** from fossil fuels. (3 points)
The institution has **partially divested** from fossil fuel companies **or** has made a **commitment to fully divest**, but **currently** still has fossil fuel investments. (2 points)
The institution has **not divested** from fossil-fuel companies, but faculty and/or students are **conducting organised advocacy** for divestment. (1 point)

Yes, the institution has investments with fossil-fuel companies and there have been **no efforts** to change that. (0 points)	
Score Assigned:	2
Score explanation: As of November 2022, the University of Pennsylvania no longer holds direct investments in fossil fuel companies, including the 200 firms with the largest potential carbon emissions in their reserves. However, Penn's endowment portfolio still includes indirect investments in fossil fuel-related assets through external investment managers. While Penn has ceased making new commitments to private equity funds dedicated to fossil fuel production, existing indirect investments remain part of the university's broader financial portfolio.	

Section Total (20 out of 32)	**62.5%**

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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%

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

Section	Raw Score %	Letter Grade
Planetary Health Curriculum (30%)	(50/72) x 100 = 69.44%	B
Interdisciplinary Research (17.5%)	(16/17) x 100 = 94.12%	A
Community Outreach and Advocacy (17.5%)	(13/14) x 100 = 92.86%	A
Support for Student-led Planetary Health Initiatives (17.5%)	(13/15) x 100= 86.67%	A
Campus Sustainability (17.5%)	(20/32) x 100 = 62.5%	B-
Institutional Grade	**(69.44x0.3 + 94.12x0.175 + 92.86x0.175 + 86.67x0.175 + 62.5x0.175) = 79.66%**	**B+**