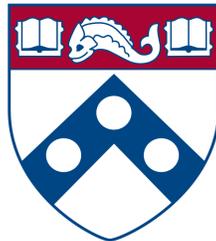




Planetary Health Report Card:

Perelman School of Medicine



Perelman
School of Medicine
UNIVERSITY of PENNSYLVANIA

2020-2021 Contributing Team:

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Summary of Findings

Curriculum	C+
<ul style="list-style-type: none"> Planetary health (PH) connections exist throughout medical education, and tuition covers up to three courses at Penn’s other schools. The administration also elected to increase the PH content for the 2020-2021 curriculum. PH connections in the curriculum should be made more explicit with more dedicated time. The medical school should identify PH (including climate change) as a priority theme and include that material in learning objectives and test questions, in addition to filling in content gaps. 	
Interdisciplinary Research	A-
<ul style="list-style-type: none"> Penn lacks an institute for interdisciplinary PH research that emphasizes the impacts of anthropogenic environmental changes on health. The medical school may draw from existing centers such as the Department of Occupational and Environmental Medicine, CEET, the Center for Public Health Initiatives, and the “One Health” program at the veterinary school. This year the university introduced the EII, which will target faculty recruitment in line with climate change, environmental justice, and sustainability. The medical school should commit to involvement in the EII and recruitment of PH researchers. 	
Community Outreach and Advocacy	B
<ul style="list-style-type: none"> Penn runs several community-focused environmental justice programs that welcome medical student involvement. The student Healthcare Sustainability Group works to expand those opportunities and strengthen connections across the university. There is poor awareness of environmental advocacy programming among students and faculty. Perelman should develop a centralized website housing all PH community programs, courses, research, funding opportunities, and events. This information should be regularly publicized via a sustainability newsletter and highlighted in the primary campus magazine. 	
Support for Student-Led Initiatives	B
<ul style="list-style-type: none"> Overall, the administration is supportive of student-led PH initiatives, offering their time, funding, and enthusiasm for student work. The administration could further support student-led initiatives by facilitating connections between research mentors and students, creating grant opportunities, and developing a student fellowship program designated for PH. 	
Sustainability	B+
<ul style="list-style-type: none"> The University has dedicated staff devoted to promoting sustainability and has adopted several measures to reach sustainability goals including: reducing fossil fuel emissions, increasing recycling, and reaching carbon neutrality. These university-wide initiatives could be tailored to the medical school through a liason or staff member focused on medical school and hospital sustainability. 	

Statement of Purpose

Planetary health is human health.

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

As future health professionals, we must be prepared to address the impacts of human-caused environmental changes on our patients’ health. This preparation is in the hands of the institutions providing our medical training. It is imperative that we hold our institutions accountable for educating medical students about the health impacts of climate change and other anthropogenic environmental changes, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices as much as possible, and engaging with surrounding communities that are most affected by environmental threats. Because climate change and environmental threats disproportionately affect vulnerable populations (for example, communities of color, 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 medical schools, we have created a Planetary Health Report Card that medical students internationally can use to grade and compare their home institutions on an annual basis. This medical-student-driven initiative aims to compare medical schools on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) interdisciplinary research in health and environment, 3) university support for student planetary health initiatives, and 4) community outreach centered on environmental health impacts 5) medical school campus sustainability.

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 change. Therefore, it is critical that medical students are trained to understand the health effects of climate change, as well as planetary health 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. Did your medical school offer elective courses to engage students in Education for Sustainable Healthcare or Planetary Health in the last year?	
3*	Yes, the medical school has offered more than one elective whose primary focus is ESH/planetary health in the past year.
2	Yes, the medical school has offered one elective whose primary focus is ESH/planetary health in the past year.
1	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.
0	No, the medical school has not offered any electives on planetary health or electives that include ESH/planetary health topics in the past year.
<p><i>Score explanation: The Perelman School of Medicine offers electives in women's health, food and nutrition, and a four-week "Community Medicine and Public Health Elective" course, which touch upon the interplay between environmental health, community health, and social determinants of health. Moreover, students have access to the public health course "Environmental and Occupational Health," and the elective course, "Challenges in Global Health," which cover sustainability and population health.</i></p>	

Curriculum: Health Effects of Climate Change

2. Does your medical school curriculum address the relationship between extreme temperature health risks and climate change, as well as the socioeconomic/racial disparities in extreme heat exposure?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.

1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation:</i> <i>In the Brain and Behavior course of the preclinical “Module 2” block, the ‘Violence and Abuse’ lecture discusses the relationship between higher temperatures/extreme heat and increase rates of crime and child abuse, which is also linked to poverty.</i></p>	

3. Does your medical school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The psychiatry section of the Brain and Behavior course in the preclinical “Module 2” includes a discussion of the behavioral health implications of coping with heat waves without air conditioning</i></p>	

4. Does your medical school curriculum address the impact of climate change on the changing patterns of infectious diseases?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The microbiology course in the preclinical “Module 1” and the infectious disease course in the preclinical “Module 2” block include a discussion of changing patterns of Lyme disease attributable to changing environmental conditions. .</i></p>	

5. Does your medical school curriculum address the cardiorespiratory health effects of climate change, including air pollution?	
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3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The respiratory system course in the preclinical “Module 2” block includes extensive discussion of air pollutants and respiratory health outcomes. This topic is covered in detail in Dr. Hari Shankar’s lecture on pulmonology.</i></p>	

6. Does your medical school curriculum address the mental health and neuropsychological effects of environmental degradation and climate change?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: During the neurology clerkship intercession, Dr. Amy Pruitt briefly discusses the neuropsychological effects of environmental exposures. Topics discussed include: climate change and spread of pathogens causing encephalitis, risks of tick-borne illnesses due to changing territories of carrier species, and perceived long term effects of Lyme disease and COVID-19.</i></p>	

7. Does your medical school curriculum address the relationships between health, individual patient food and water security, ecosystem health, and climate change?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: This topic is covered in several electives, including the “Frontiers in Public Health” course offered to fourth year medical students. In this course, several faculty talk about environmental health as well as the challenges associated with lead contamination of drinking water in the Philadelphia community.</i></p>	

8. Does your medical school curriculum address the outsized impact of climate change on marginalized populations such as those with low SES, women, communities of color, children, homeless populations, and older adults?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: This topic is not covered in the medical school curriculum.

9. Does your medical school curriculum address the unequal health impacts of climate change globally?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: The History and Science of Climate Change is a course offered by the Environmental Studies department that Perelman students can choose to take. It covers the history and scale of climate change, and explore how different populations face different climate challenges due to global and regional climate variability.

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

10. Does your medical school curriculum address the reproductive health effects of industry-related environmental toxins (e.g. air pollution, pesticides)?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: Environmental and Occupational Health is a course offered by the MPH program that Perelman students can choose to take. It covers the body's response to toxic substances and the health risks associated with various pollutants and environmental hazards.

11. Does your medical school curriculum address important human-caused environmental threats that are relevant to the university's surrounding community?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: The medical school offered an optional symposium lecture for students following the June 2019 explosion of the Philadelphia Energy Solutions Oil Refinery, discussing health impacts and implications for residents of the city.

12. Does your medical school curriculum address the unique climate and environmental health challenges that have impacted and are impacting Indigenous communities?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: Foundations of Global Health--Addressing Health Disparities is a course offered by the MPH program that Perelman students can choose to take. In week 5, this course covers some of the barriers to access to healthcare that Native Americans face. One of these discussions involves the challenges and unexpected positive outcomes of contact tracing in Native American reservations during the COVID-19 pandemic.

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

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: Environmental and Occupational Health is a course offered by the MPH program that Perelman students can choose to take. It addresses how environmental health issues differ in children and other vulnerable populations when compared to adults.

Curriculum: Sustainability

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

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: This topic is not covered in the curriculum.

15. Does your medical school curriculum highlight the waste generated by the healthcare system and identify ways to advocate for and implement sustainable best practices in health care?

3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: During the orientation for clerkships, students engage in discussions on the extent of waste generated by the hospital system, and how excess medical tests exhaust resources but don't contribute to high value care.

Curriculum: Clinical Applications

16. In training for patient encounters, does your medical school’s curriculum introduce strategies to have conversations with patients about the health effects of climate change?	
2	Yes, there are strategies introduced for having conversations with patients about climate change in the core curriculum.
1	Yes, there are strategies introduced for having conversations with patients about climate change in elective coursework.
0	No, there are not strategies introduced for having conversations with patients about climate change
<p><i>Score explanation: The medical school curriculum does not introduce strategies to have conversations with patients about the health effects of climate change in training for patient encounters.</i></p>	

17. In training for patient encounters, does your medical school’s curriculum introduce strategies for taking an environmental history or exposure history?	
2	Yes, the core curriculum includes strategies for taking an environmental history.
1	Only elective coursework includes strategies for taking an environmental history.
0	No, the curriculum does not include strategies for taking an environmental history.
<p><i>Score explanation: The importance of taking an environmental history was highlighted during the core pulmonology curriculum. Students then practiced environmental history taking during the 2nd year Introduction to Clinical Medicine (ICM) course.</i></p>	

Curriculum: Administrative Support for Planetary Health

18. Is your medical school currently in the process of improving Education for Sustainable Healthcare (ESH)/planetary health education?	
4	Yes, the medical school is currently in the process of making major improvements to ESH/planetary health education.
2	Yes, the medical school is currently in the process of making minor improvements to ESH/planetary health education.
0	No, there are no improvements to planetary health education in progress.

Score explanation: PSOM administration has been very receptive to identifying ways to better integrate planetary health education into the curriculum. Next year, the school will be offering a “Climate Change and Health” elective which aims to 1) discuss the relationship between climate and medicine, 2) examine how climate change affects specific disease processes, and 3) assess the relationship between social determinants of health and climate change. Moreover, course directors have recognized the importance of planetary health, and incorporate relevant planetary health content when appropriate.

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

6	Planetary health/ESH topics are well integrated into the core medical school curriculum.
4	Some planetary health/ESH topics are appropriately integrated into the core medical student curriculum.
2	Planetary health/ESH is not integrated and is primarily addressed in (a) standalone lecture(s).
0	There is minimal/no education for sustainable healthcare.

Score explanation: Planetary health themes have been incorporated into the curriculum in several ways including: the relationship between climate change and infectious disease, and PH connections to nephrology and dermatology. Several lectures and discussions incorporate planetary health material from Module 1, Module 2, and clerkship intersessions.

20. Bonus: Does your medical school have a program that offers incentives for faculty/departments to develop new planetary health/ESH courses and/or incorporate planetary health/ESH into existing courses?

1*	Yes, the medical school has an incentive program.
0	No, the medical school does not have an incentive program.

Score explanation: There are no incentive programs, financial or otherwise, to encourage faculty to incorporate themes of planetary health and the intersection of climate change and medicine into the curriculum.

Section Total (32 out of 58)	C+
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Are there additional curriculum resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

Interdisciplinary Research

Section Overview: *This section evaluates the quality and quantity of interdisciplinary planetary health research at the medical school and 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, medical schools 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 emphasized.*

1.Are there researchers engaged in planetary health research and healthcare sustainability research at your medical school?	
4	Yes, there are faculty members at the School of Medicine who have a primary research focus in planetary health and healthcare sustainability.
3	Yes, there are faculty members at the School of Medicine who have a primary research focus in a planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the School of Medicine who are conducting research related to planetary health or healthcare sustainability, but it is not their primary research focus.
1	There are planetary health and/or healthcare sustainability researchers at the institution, but none associated with the medical school.
0	No, there are no planetary health and/or healthcare sustainability researchers at the institution or medical school at this time.
<p><i>Score explanation:</i></p> <p><i>Dr. Marilyn Howarth (environmental & occupational health) has studied the environmental justice and health implications of the fossil fuel industry, as well as other public health implications of anthropogenic environmental toxicants.</i></p> <p><i>Ex: Jemielita T, Gerton GL, Neidell M, ...Howarth M,... Elferink C. Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates [published correction appears in PLoS One. 2015;10(8):e0137371]. PLoS One. 2015;10(7):e0131093. Published 2015 Jul 15. doi:10.1371/journal.pone.0131093</i></p> <p><i>Dr. Misha Rosenbach (dermatology) has researched and presented on the impact of climate change on skin disease in North America. He has also published around the importance of the link between climate change and health.</i></p> <p><i>Ex: Kaffenberger BH, Shetlar D, Norton SA, Rosenbach M. The effect of climate change on skin disease in North America. J Am Acad Dermatol. 2017;76(1):140–147. doi:10.1016/j.jaad.2016.08.014</i></p> <p><i>Dr. Sean Hennnessy (epidemiology) has researched climate-drug interactions.</i></p>	

*Ex: Nam YH, Bilker WB, Leonard CE, Bell ML, Alexander LM, **Hennesy S**. Effect of statins on the association between high temperature and all-cause mortality in a socioeconomically disadvantaged population: a cohort study [published correction appears in *Sci Rep*. 2019 Jul 24;9(1):11010]. *Sci Rep*. 2019;9(1):4685. Published 2019 Mar 18. doi:10.1038/s41598-019-41109-0*

Dr. Gregory Tasian (nephrology) has researched the impact of changing climate on risk of kidney stone development.

*Ex: **Tasian GE**, Pulido JE, Gasparrini A, et al. Daily mean temperature and clinical kidney stone presentation in five U.S. metropolitan areas: a time-series analysis. *Environ Health Perspect*. 2014;122(10):1081–1087. doi:10.1289/ehp.1307703*

Dr. Eugenia South (emergency medicine) has studied the community health impacts of urban greening.

*Ex: **South EC**, Hohl BC, Kondo MC, MacDonald JM, Branas CC. Effect of Greening Vacant Land on Mental Health of Community-Dwelling Adults: A Cluster Randomized Trial [published correction appears in *JAMA Netw Open*. 2018 Aug 3;1(4):e182583]. *JAMA Netw Open*. 2018;1(3):e180298. Published 2018 Jul 6. doi:10.1001/jamanetworkopen.2018.0298*

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

3	There is at least one dedicated department or institute for interdisciplinary planetary health research.
2	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.
1	There is an Occupational and Environmental Health department, but no interdisciplinary department or institute for planetary health research.
0	There is no dedicated department or institute.

Score explanation: The Perelman School of Medicine houses the Center of Excellence in Environmental Toxicology ([CEET](#)), which is a valuable multidisciplinary resource for examining environmental health risks and exposures through the lens of environmental toxicology. However, its mission and research activities do not completely fulfill the definition of “planetary health.” The CEET’s mission is “to elucidate the mechanistic links between environmental exposures and human disease and translate its findings into action to improve the health of vulnerable individuals, and local, national and global communities.” The [definition of planetary health is](#) “a field focused on characterizing the human health impacts of human-caused disruptions of Earth’s natural systems” and “on understanding and addressing global environmental change and its health impacts.” Therefore, the primary piece missing is research around the population and individual health impacts of climate change, beyond toxicology (i.e. anthropogenic global change to Earth’s natural systems).

Other centers at Penn with room to expand to encompass planetary health are the Wharton Climate Risk Center; Water Center at Penn; Center for Global Health; Institute for Environmental Medicine; and Center for Public Health Initiatives.

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 medical school?

3	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.
2	Yes, there is a process in which community members impacted by climate and environmental injustice advise the climate + environmental research agenda.
1	No, but there are current efforts to establish a process for community members to advise or make decisions on the research agenda.
0	There is no process, and no efforts to create such a process.

Score explanation: No processes currently exist at Penn for communities impacted by climate change to provide their insights to the research agenda.

4. Does your institution have a planetary health website, or a website centralizing various campus resources related to health and the environment?

3	There is an easy-to-use, adequately comprehensive website that centralizes 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.
2	There is a website that attempts to centralize various campus resources related to health and the environment, but it is hard-to-use, not updated, or not adequately comprehensive.
1	The institution has an Office of Sustainability website that includes some resources related to health and the environment.
0	There is no website.

Score explanation: The Perelman School of Medicine has a planetary health website which includes a database of resources for students interested in engaging with planetary health, a link to the planetary health report card, links to funding resources, and relevant elective courses.

<https://www.med.upenn.edu/student/planetary-health.html>

5. Has your institution recently hosted a conference or symposium on topics related to planetary

health?	
4	Yes, the institution has hosted more than one conference or symposium on topics related to planetary health in the past year, including at least one on climate change.
3	Yes, the institution has hosted one conference or symposium on topics related to planetary health in the past year.
2	Yes, the institution has hosted a conference on topics related to planetary health in the past three years.
1	The institution has not hosted any conferences directly, but they have provided financial support for a local planetary health event.
0	No, the institution has not hosted a conference on topics related to planetary health in the past three years.

Score explanation: PennVet hosted a weeklong multi-school One Health conference/symposium in 2018 and 2019, to which medical students received multiple direct invitations. Some portions of the conference were also hosted at locations on the medical school campus. The concept of One Health describes “the critical links between the health of people, animals, and the environment,” which relates to planetary health. More information on the 2019 event can be found [here](#).

The medical school offered an optional symposium lecture for students following the June 2019 explosion of the Philadelphia Energy Solutions Oil Refinery, discussing health impacts and implications for residents of the city.

6. Has your institution or medical school joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education?	
2	Yes, the medical school has joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education.
1	Yes, the institution has joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education, but the medical school specifically has not.
0	No, the institution has not joined the Planetary Health Alliance or the Global Consortium on Climate and Health Education.

Score explanation: The medical school is a member of the Global Consortium on Climate Change and Health

Section Total (16 out of 19)	A-
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Are there additional research resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

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 color. 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.*

1. Does your medical school partner with community organizations to promote planetary and environmental health?	
3	Yes, the medical school meaningfully partners with multiple community organizations to promote planetary and environmental health.
2	Yes, the medical school meaningfully partners with one community organization to promote planetary and environmental health.
1	The institution partners with community organizations, but the medical school is not part of that partnership.
0	No, there is no such meaningful community partnership.
<p><i>Score explanation: Penn Medicine formally interfaces with one or more community organizations to promote planetary and environmental health through the Bridging the Gaps program. Students can partake 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. In addition, students may work with a community partner of their choosing that fits the guidelines for Bridging the Gaps, including groups focused on environmental/planetary health. More information about Bridging the Gaps can be found here.</i></p>	

2. Does your medical school offer community-facing courses or events regarding planetary health?	
3	The medical school offers community-facing courses or events at least once every year.
2	The medical school offers courses or events open to the community at least once per year, but they are not primarily created for a community audience.
1	The institution has offered community-facing courses or events, but the medical school was not involved in planning those courses or events.

0	The medical school has not offered such community-facing courses or events.
<p><i>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.</i></p>	

3. Does your medical school have regular coverage of issues related to planetary health and/or sustainable healthcare in university update communications?	
2	Yes, all students regularly receive communication updates dedicated to planetary health and/or sustainable healthcare.
1	Yes, planetary health and/or sustainable healthcare topics are sometimes included in communication updates.
0	Students do not regularly receive communications about planetary health or sustainable healthcare.
<p><i>Score explanation: Although not enough to qualify as “in the majority of issues,” there have been articles published in Penn Medicine News around planetary health themes, such as this 2019 piece about climate change & the allergy season and this 2019 piece about the relationship between connecting with nature & a desire to foster health. The broader university magazine, Penn Today, also publishes pieces around climate change, some of which draw a relationship between climate change and health, collated here.</i></p>	

4. Does the medical school offer continuing medical education (CME) courses that address planetary health and/or sustainable healthcare?	
2	Yes, multiple in-person or online CME courses relating to planetary health and/or sustainable healthcare are offered, including at least one with a primary focus of planetary health.
1	Yes, one in-person or online CME course related to planetary health and/or sustainable healthcare is offered.
0	There are no CME courses on planetary health or sustainable healthcare topics.
<p><i>Score explanation: While there are not CME courses explicitly designated for “planetary health,” there are CME courses that address planetary health themes, earning this category full points. Environmental & Occupational Medicine Grand Rounds and Journal Club both count for CME credit and address themes of planetary health. Medical Education Journal Club also counts for CME credit, and a session in 2019 had as its paper a piece about including climate change in medical school curricula. Finally, there is an online CME offering titled Social and Environmental Determinants of Sleep which also addresses themes of environmental impacts on health.</i></p>	

5. Do hospitals affiliated with your medical school have accessible educational materials for patients about environmental health exposures?

2	Yes, all affiliated hospitals have accessible educational materials for patients.
1	Some affiliated hospitals have accessible educational materials for patients.
0	No affiliated medical centers have accessible educational materials for patients.

Score explanation: The medical center provides educational materials for patients about environmental health exposures through the Center of Excellence in Environmental Toxicology ([CEET](#)). Patients are able to learn more about environmental health through pages such as “How polluted is my environment?” However, these resources can be difficult to find without prior knowledge of the CEET.

6. Do hospitals affiliated with your medical school have accessible educational materials for patients about climate change and health impacts?

2	Yes, all affiliated hospitals have accessible educational materials for patients.
1	Some affiliated hospitals have accessible educational materials for patients.
0	No affiliated hospitals have accessible educational materials for patients.

Score explanation: The Children’s Hospital of Philadelphia’s website includes articles like [this](#), which highlight the impacts of climate change and environmental health.

Section Total (10 out of 14)	B
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Are there additional community engagement and advocacy resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

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.

1. Does your institution offer support for medical students interested in enacting a sustainability initiative?	
2	Yes, the institution offers grants available to medical students for students to enact sustainability initiatives.
1	The medical school encourages sustainability QI projects (to fulfill clerkship or longitudinal requirements) and offers resources to help students succeed in these projects, but there is no student funding available.
0	No, the institution does not offer opportunities or support for sustainability initiatives.
<p><i>Score explanation: The University of Pennsylvania Office of Sustainability has a Green Fund Grant to which students can apply to receive funding for sustainability initiatives. In 2020, the Perelman Medical Student Government announced the creation of its 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.</i></p>	

2. Does your institution offer opportunities for medical students to do research related to planetary health and/or sustainable healthcare?	
3*	The institution offers an explicit paid fellowship for medical students to do research related to planetary health and/or sustainable healthcare.
2	The institution offers paid research opportunities for students and planetary health/sustainable healthcare projects would be considered eligible.
1	There are unfunded research opportunities for students to perform research related to planetary health/sustainable healthcare.
0	There are no opportunities for students to receive funding for planetary health/sustainable healthcare research.
<p><i>Score explanation: The Perelman School of Medicine offers students the opportunity to work with faculty in the Center of Excellence in Environmental Toxicology, whose focus is on several PH topics.</i></p>	

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

2	The medical school has a webpage with specific information related to planetary health or sustainable healthcare that includes up-to-date information on relevant initiatives and contact information of potential mentors.
1	There is a medical school webpage that features some information on projects and mentors within planetary health and sustainable healthcare within the medical school, but it lacks key information.
0	There is no medical-school specific webpage for locating planetary health and/or sustainable healthcare projects or mentors.

Score explanation: The Perelman School of Medicine Center of Excellence in Environmental Toxicity's website offers an extensive list of faculty members (and their respective contact information) whose research relates to environmental impacts on health outcomes. These faculty are listed categorically, under [Air Pollution & Lung Health](#), [Environmental Exposures and Cancer](#), [Windows of Susceptibility](#), [Environmental Neuroscience](#), and [Community Engagement](#). This category received full points, but an area for improvement could be creating a webpage that encompasses every researcher that conducts work related to planetary health across all medical departments and the university.

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

2	Yes, there is a funded student organization with faculty support at my medical school dedicated to planetary health or sustainability in healthcare.
1	Yes, there is a student organization at my medical school dedicated to planetary health or sustainability in healthcare but it lacks faculty support and/or funding.
0	No, there is not a student organization at my institution dedicated to planetary health or sustainability in healthcare.

Score explanation: There is a student group at the medical school called the Healthcare Sustainability Group dedicated to the themes of planetary health and sustainability in medicine. It received funding from the Medical Student Government fund for the 2019-2020 academic year and has a physician faculty advisor (Dr. Misha Rosenbach).

5. Is there a student liaison representing sustainability interests who serves on a medical school or institutional decision-making council to advocate for sustainability best practices?

1	Yes, there is a student representative that serves on a medical school or institutional decision-making council.
0	No, there is no such student representative.
<p><i>Score explanation: Yes, there are several faculty members who regularly meet with students, and are invested in promoting sustainability measures in the school. The medical school administration has been listening to and engaging with the student sustainability group, which has brought along several administrative changes including: integration of planetary health content into core curriculum, new elective course dedicated to planetary health, and increased faculty PH engagement.</i></p>	

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)	
1	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.
1	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 organize hiking, backpacking, kayaking, or other outings for students) that follow Leave No Trace principles.

Score explanation:

- **Garden:**
 - Through Penn Med's [Bridging the Gaps](#) program, students can participate in an urban community agriculture program in West Philadelphia to promote community health and wellness.
- **Conferences, speaker series, symposia, or similar events:**
 - Dr. Farah Hussain is an Assistant Professor of Clinical Medicine who works as a hospitalist. She gave a presentation in February 2020 in collaboration with the medical school's Gold Humanism Society introducing scientific data that supports the threat of climate change, how it affects our patients, and what healthcare providers can do to protect vulnerable communities.
 - In February 2020, an MSI at Perelman gave a Penn X Talk for the school on the interconnectedness of climate and health and why it should matter to medical professionals on a patient-to-patient clinical basis. She designed and presented the talk with mentorship from Dr. Nadia Bennett, who advises the PennTalks competition program and is also a course director at Penn Med.
 - In September 2019, professors and students from across the university united in a series of 1.5 Minute Climate Lectures to raise awareness around the consequences of the climate crisis and to advocate for large-scale changes in the university community.
- **Local volunteer opportunities:**
 - Penn Med has recently began the Philly TREES initiative, which aims to 1) publicize the benefits of urban trees, 2) increase greening of a central block in Southwest Philadelphia, and 3) support Philly residents' requests to plant street trees
- **Wilderness or outdoor programs:**
 - Penn Med leads an annual student-run backpacking trip for first year medical students that follows Leave No Trace principles. The event is supported by Medical Student Government funding.

Section Total (11 out of 15)

B

Are there additional student-led initiative resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

Campus Sustainability

Section Overview: *This section evaluates the support and engagement in sustainability initiatives by the medical school and/or 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 endeavor, the healthcare sector is well poised to lead the world to a more sustainable future. This will involve scrutinizing 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 minimizing environmental impact.*

1. Does your medical school and/or institution have an Office of Sustainability?	
3	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 and/or medical school.
2	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 medical school and/or hospital sustainability.
1	There are no salaried sustainability staff, but there is a sustainability task force or committee
0	There are no staff members or task force responsible for overseeing campus sustainability
<p><i>Score explanation: The University of Pennsylvania has an Office of Sustainability as a part of Penn Sustainability, which is a University-wide initiative aimed toward advancing sustainability practices throughout the campus. The Office of Sustainability has multiple full-time staff dedicated to campus sustainability. However, there is no specific staff member in charge of medical school and/or hospital sustainability.</i></p>	

2. Does your medical school and/or institution have a stated goal of carbon neutrality by 2050?	
4*	The medical school is already carbon neutral.
3	Yes, there is a stated carbon neutrality goal and the medical school has a well-defined and adequate plan in place to achieve this goal.
2	Yes, there is a stated carbon neutrality goal, but the medical school has not created a plan to reach that goal or the plan is inadequate.
1	There is a CO2 emission reduction goal, but it is not one of carbon neutrality.

0	There is no stated goal for reduction of CO2 emissions.
<p><i>Score explanation: The University of Pennsylvania has the goal of carbon neutrality by 2050. The Operations and Maintenance Department, within the Division of Facilities and Real Estate Services (FRES), works with the Environmental Sustainability Advisory Committee's Utilities and Operations Subcommittee to identify and execute funded projects that meet this goal. There is a well-defined and adequate plan in place to achieve this goal for the overall University. The medical school supports the Climate and Sustainability Action Plan 3.0, which includes the goal of carbon neutrality by 2050. However, there is not a plan in place for the medical school specifically to achieve this goal.</i></p>	

3. Do buildings/infrastructure used by the medical school for teaching (not including the hospital) utilize renewable energy?	
3*	Yes medical school buildings are 100% powered by renewable energy
2	Medical school buildings source >80% of energy needs from off-site and/or on-site renewable energy.
1	Medical school buildings source >20% of energy needs from off-site and/or on-site renewable energy.
0	Medical school buildings source <20% of energy needs from off-site and/or on-site renewable energy.
<p><i>Score explanation: Penn currently does not utilize renewable energy, but has recently entered a solar PPA that will offset Penn's electricity usage by 75% starting in 2023.</i> https://penntoday.upenn.edu/news/penn-signs-power-purchase-agreement-largest-solar-project-pennsylvania</p>	

4. Are sustainable building practices utilized for new and old buildings on the medical school campus, with design and construction of new buildings and remodeling of old buildings conforming to a published rating system or sustainable building code/guideline?	
3	Yes, sustainable building practices are utilized for new buildings on the medical school campus and the majority of old buildings have been retrofitted to be more sustainable.
2	Sustainable building practices are utilized for new buildings on the medical school campus, but most old buildings have not been retrofitted.
1	Sustainable building practices are inadequately or incompletely implemented for new buildings.
0	Sustainability is not considered in the construction of new buildings.
<p><i>Score explanation: Under the campus development plan Penn Connects, new buildings and major renovation projects at the University of Pennsylvania currently under design are registered with the US</i></p>	

Green Building Council, and are targeting LEED Silver rating or higher. The majority of [old buildings](#) on the University of Pennsylvania campus have been retrofitted to be more sustainable.

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

2	Yes, the medical school 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-utilized by students. Alternatively, the campus location is not amenable to unsustainable forms of transportation by default.
1	The medical school has implemented some strategies to provide environmentally-friendly transportation options, but the options are unsatisfactorily accessible or advertised.
0	The medical school has not implemented strategies to encourage and provide environmentally-friendly transportation options.

Score explanation: The University of Pennsylvania has implemented [strategies that encourage commuting by bicycle](#), including three available bike repair stations, bike and property registration to protect against theft, student helmet reimbursement, and a Bike Commuter Expense Reimbursement Program. The University also supports [other forms of sustainable transportation](#), such as city public transit discounts, WageWorks Commuter Card discounts, vanpools through Enterprise Rideshare, and parking discounts for carpoolers.

6. Does your medical school have an organics recycling program (compost) and a conventional recycling program (aluminum/paper/plastic/glass)?

2	Yes, the medical school has both compost and recycling programs accessible to students and faculty.
1	The medical school has either recycling or compost programs accessible to students and faculty, but not both.
0	There is no compost or recycling program at the medical school.

Score explanation: There is [single-stream recycling](#) accessible across the entire University campus. All campus dining halls on the campus collect kitchen waste for [composting](#). Composting bins are accessible to diners at multiple dining locations across campus. Many large-scale events are made Zero-Waste, where 90% of waste is composted or recycled.

7. Does the medical school apply sustainability criteria when making decisions about the campus food and beverage selections?

3	Yes, the medical school has adequate sustainability requirements for food and beverages and is engaged in efforts to increase food and beverage sustainability.
2	There are sustainability guidelines for food and beverages, but they are insufficient or optional. The medical school is engaged in efforts to increase food and beverage sustainability.
1	There are sustainability guidelines for food and beverages, but they are insufficient or optional. The medical school is not engaged in efforts to increase food and beverage sustainability.
0	There are no sustainability guidelines for food and beverages.
<p><i>Score explanation: The University of Pennsylvania and Bon Appétit Management Company are committed to sustainable practices for food and beverages. Penn Dining and Bon Appétit provide sustainable foods that respect farmers, workers, and animals. There are also initiatives intended to educate the Penn community on sustainable food practices: Food Week highlights worker rights, local farming, and food waste management through seminars, workshops, and community service activities; Eat Local Challenge supports and publicizes local farmers with cooking demonstrations; and University Square Farmers Market offers produce from local farmers that students can purchase using their dining plans. The Catering@Penn webpage allows users to search for Penn's Preferred Contract Caterers. Search criteria include environmental sustainability capabilities and local/regional designations, with which each caterer is rated based on a four-leveled rating system.</i></p>	

8. Does the medical school or associated institution apply sustainability criteria when making decisions about supply procurement?	
3	Yes, the medical school has adequate sustainability requirements for supply procurement and is engaged in efforts to increase sustainability of procurement.
2	There are sustainability guidelines for supply procurement, but they are insufficient or optional. The medical school is engaged in efforts to increase sustainability of procurement.
1	There are sustainability guidelines for supply procurement, but they are insufficient or optional. The medical school is not engaged in efforts to increase sustainability of procurement.
0	There are no sustainability guidelines for supply procurement.
<p><i>Score explanation: A member of the Sustainable Purchasing Leadership Council, Purchasing Services at the University of Pennsylvania collaborates with Penn Sustainability to meet the goals of Penn's Climate Action Plan 2.0. Purchasing Services encourages sustainability in Penn's supply chain and institutional purchasers by identifying and implementing green product solutions.</i></p>	

9. Are there sustainability requirements or guidelines for events hosted at the medical school?	
2	Every event hosted at the medical school must abide by sustainability criteria.
1	The medical school strongly recommends or incentivizes sustainability measures, but they are not required.

0	There are no sustainability guidelines for medical school events.
<p><i>Score explanation: With regard to hosting events, the Perelman School of Medicine encourages the use of sustainability measures, but they are not required. The Green Events Guide helps students, faculty and staff plan more sustainable events.</i></p>	

10. Does your medical school have programs and initiatives to assist with making lab spaces more environmentally sustainable?	
2	Yes, the medical school has programs and initiatives to assist with making lab spaces more environmentally sustainable.
1	There are guidelines on how to make lab spaces more environmentally sustainable, but not programs or initiatives.
0	There are no efforts at the medical school to make lab spaces more sustainable.
<p><i>Score explanation: The University of Pennsylvania has the Green Labs program, which is guided by an Executive Committee. The program provides actionable guidelines to labs across campus to practice greener, more sustainable practices to reduce energy usage. Labs voluntarily sign a pledge to adhere to the Green Lab guidelines and become Committed Green Labs.</i></p>	

11. Does your institution’s endowment portfolio investments include fossil-fuel companies?	
4	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.
3	No, the institution is entirely divested from fossil fuels.
2	The institution has partially divested from fossil-fuel companies.
1	The institution has not divested from fossil-fuel companies, but faculty and/or students are conducting organized advocacy for divestment.
0	Yes, the institution has investments with fossil-fuel companies and there have been no efforts to change that.
<p><i>Score explanation: The University of Pennsylvania has stated that it currently does not hold and no longer plans to hold direct investments in companies thermal coal and bituminous (tar) sands. They plan to limit the scope of fossil fuel investments in their portfolio.</i></p>	

Section Total (22 out of 29)	B+
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Are there additional sustainability resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

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	Grade
Planetary Health Curriculum (30%)	32 / 58 = 55%	C+
Interdisciplinary Research (17.5%)	16 / 19 = 84%	A-
Community Outreach and Advocacy (17.5%)	10 / 14 = 71%	B
Support for Student-led Planetary Health Initiatives (17.5%)	11 / 15 = 73%	B
Campus Sustainability (17.5%)	22 / 29 = 76%	B+
Institutional Grade	70%	B