



Planetary Health Report Card (Medicine):

*University of Massachusetts
T.H. Chan School of Medicine*



UMass Chan
MEDICAL SCHOOL

2023-2024 Contributing Team:

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Summary of Findings

Overall	B -
<u>Curriculum</u>	C +
<ul style="list-style-type: none"> Although some climate change and planetary health topics are integrated into the core medical school curriculum, these topics are insufficient in scope and concentrated in preclinical years. The school has implemented a Climate Curriculum Committee with faculty and student participation to further planetary health integration into the curriculum. Recommendations: Encourage the active participation of the Climate Curriculum Committee in increasing the integration of planetary health within the preclinical years. The committee should be encouraged to extend the planetary health content into clinical years by working with clerkship directors. 	
<u>Interdisciplinary Research</u>	C -
<ul style="list-style-type: none"> UMass Chan has continued partnerships with Practice Greenhealth and the Global Consortium on Climate Change and Health Education. Some faculty members have an interest in planetary health and the medical school actively encourages participation in faculty-sponsored research. Recommendations: UMass Chan should develop a climate health research center to foster collaboration with other UMass campuses and consider hosting a conference or symposium focused on planetary health. UMass should consult with communities disproportionately impacted by climate change and environmental injustice to inform ongoing and future research at the medical school. 	
<u>Community Outreach and Advocacy</u>	B +
<ul style="list-style-type: none"> UMass Chan Medical School (UMMS) partners with local organizations focused on environmental justice during Population Health Clerkships, allowing students to develop climate advocacy skills and to learn about environmental justice and equity in their communities. UMass patient libraries carry resources to educate patients about environmental and climate impacts on health. Recommendations: UMass should continue to foster and grow partnerships with additional climate-minded organizations as well as develop educational materials targeted towards postgraduate providers. 	
<u>Support for Student-Led Initiatives</u>	B
<ul style="list-style-type: none"> UMMS has a student and faculty climate change organization in its fifth year of operation. UMass also supports a variety of student-run initiatives including a thriving community garden and Climate Change and Health course. Recommendations: UMass Chan should develop initiatives to help foster opportunities for projects and research on climate health among the student body and staff by offering grants or organizing climate research projects that are open to student help. Efforts should be made to ensure climate advocate representation among the school's governing bodies. 	
<u>Campus Sustainability</u>	C
<ul style="list-style-type: none"> The Sustainability Office supports student-led initiatives around climate and health, is increasing the number of electric vehicle charging stations, and is working with vendors to increase the sustainability of procurements. Recommendations: The UMass system should prioritize divesting from all indirect fossil fuel holdings. The Sustainability Office should implement a sustainable event guide for all events held on campus. 	

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 analyzing 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, 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 nationally and internationally on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) interdisciplinary research in health and environment, 3) university support for student planetary health initiatives, and 4) community outreach centered on environmental health impacts 5) medical school campus sustainability.

Definitions & Other Considerations

Definitions:

- **Planetary Health:** is described by the Planetary Health Alliance as “the health of human civilisation and the state of the natural systems on which it depends.” For example, topics such as climate change, declining biodiversity, shortages of arable land and freshwater, and pollution would all fall under the realm of planetary health. Both planetary health and traditional ‘environmental health’ examine the relationship between human health and the external environment, including extreme temperatures, chemicals, vector-borne diseases, etc. Planetary health explicitly concerns itself with the potential health harms associated with human-caused perturbations of natural systems. Therefore, the human health focus of planetary health makes the field well-adapted for the context of medical school education. Throughout this report card, we use the term planetary health to refer to this broad swath of topics, but resources do not need to explicitly include the term “planetary health” to satisfy the metric.
- **Sustainable Healthcare:** As defined by the Academy of Royal Colleges, sustainable healthcare involves ensuring the ability to provide good quality care for future generations by balancing the economic, environmental, and social constraints and demands within health care settings. A sustainable healthcare system maintains population health, reduces disease burden and minimises use of healthcare services.
- **Education for Sustainable Healthcare (ESH):** is defined as the process of equipping current and future health professionals with the knowledge, attitudes, skills and capacity to provide environmentally sustainable services through health professional education, thus working to decrease the enormous environmental impact of the healthcare industry. Planetary Health Education is an integral part of this education rather than an end in itself. This is because knowledge on Planetary Health is required to be able to fully understand the necessity of sustainable healthcare as well as being part of the broader knowledge needed to fully protect and promote health. In summary, ESH is covered by the three Priority Learning Outcomes of the Centre of Sustainable Healthcare below, and Planetary Health Education is embraced in the first learning objective and is a fundamental requirement to achieve learning outcomes 2 and 3:
 1. Describe how the environment and human health interact at different levels.
 2. Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems.
 3. Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment.
- **Medical School vs. Institution:** When “medical school” is specified in the report card, this only refers to curriculum and resources offered by the School 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. 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 providers 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 mold 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.
- **Elective:** The word "elective" refers to an optional course or lecture series that a medical student can opt to take part in but is not a requirement in the core curriculum. Generally, these elective courses take place in the preclinical curriculum but vary by school.
- **Clerkship:** 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 or placements.

Other considerations:

- If there are more than one "tracks" at your medical school 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).

Added to our resources in 2022, the Planetary Health Report Card [Literature Review by Metric](#) collates the evidence behind each of the metrics in the Planetary Health Report Card. It serves as a collection of references for further learning and a resource for those advocating for increased planetary health engagement at their institutions.

Planetary Health Curriculum

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

Curriculum: General

1.1. Did your <u>medical school</u> offer elective courses (student selected modules) to engage students in Education for Sustainable Healthcare or Planetary Health in the last year?	
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: All first and second year students at UMass Chan have the opportunity to take Optional Enrichment Electives which are supplementary curriculums designed and facilitated by medical students. One elective offered in the fall of 2023, "Climate Health & Action", offered students a six week lecture series detailing the numerous intersections of climate and healthcare. Given the presence of one optional elective that primarily focused on climate change and/or planetary health, we are awarding two points.</i></p>	

Curriculum: Health Effects of Climate Change

1.2. Does your <u>medical school</u> curriculum address the relationship between extreme heat, health risks, 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 was addressed in the Optional Enrichment Elective "Climate Health & Action" which discussed how droughts can drive people in developing countries to travel longer</i></p>	

distances for fresh water, leading to musculoskeletal issues, exposure to violence, and exposure to infectious agents.

1.3. 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.

Score explanation: In the UMass Chan Medical School's required first year Vista Curriculum Principles course, lecturers include one slide discussing the impact of extreme weather events on cancer survival - including how extreme weather events often lead to increased exposure to carcinogens and decreased access to medical treatment. The Vista Epi-Bio course mentioned health care delivery interruption post extreme weather events. In addition, the Social Determinants of Health required an independent learning module in Patients Two, also part of the Vista curriculum, which briefly covers extreme weather events in relation to climate change and health care delivery. In the Climate Health and Action optional elective, lecturers addressed extreme weather events' disruptions in healthcare delivery and healthcare systems.

1.4. 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.

Score explanation: This topic was briefly discussed in a "Fever and Rash" lecture in the first year curriculum Blood, Immunity, and Infections block, in which she explains how climate change has turned tick-borne disease into a year-round concern.

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

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: In the second year respiratory block, the school offers a case-based learning style lecture on the consequences of climate change and global warming on allergic rhinitis and asthma. The lecture touches on the biological effects of pollution, ground level ozone, particulate matter and indoor air pollution, as well as the racial and socioeconomic disparities of exposure and disease burden. Additionally, in a lecture entitled Obstructive Lung Disease in the same block addresses the connection between ozone, particulate matter, and earlier onset and longer duration pollen seasons and respiratory health. Lastly, in the optional elective, Climate Health & Action, students heard from a representative from the Boston Physicians for Social Responsibility who presented on the health effects of air pollution which included a detailed explanation of the pulmonary and cardiovascular consequences.

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

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: In the second year Cardiovascular System block students are required to complete an independent learning module on the connection between air pollution and vascular disease. The module emphasizes the relationship between particulate matter from both anthropogenic sources and climate-related sources (e.g. wildfires, and dust) and vascular disease, such as coronary atherosclerosis. Additionally, during the optional elective, Climate Health & Action, a lecturer presented about the risks posed by extreme heat on pregnant people, particularly in their third trimester.

1.7. 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.

Score explanation: In the spring of 2023, second year students in their Nervous System Block heard about the impact of climate change on mental health during her introductory lecture. The lecturer also provided a list of optional reading assignments and multimedia resources on the various connections between climate change and health including the effect of climate change and depression in young people, extreme weather events and PTSD and rising temperatures and suicide rates. Additionally, the Psychiatry Interest Group organized an optional lecture with the Climate Psychiatry Alliance, detailing the trends in climate anxiety and tools to help patients.

1.8. 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.

Score explanation: Students learn about the direct and indirect impact of food insecurity in the second year course Patients Two Social Determinants of Health material. In addition, during the Early Clinical Learning course, which integrates course content with clinical applicability, students participate in a Social History taking session which discusses the relationships between health, individual patient food and water security, and climate change.

1.9. 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, Indigenous communities, 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: During the Patients Two lecture, "Intro to Social Determinants of Health," second year medical students learn about the impact of climate change specifically within marginalized communities.

During the optional elective, Climate Health & Action, students learned about the unique ways that climate change impacts women, girls, and gender minorities, especially in the developing world. For example, the lecturer discussed how droughts can disproportionately affect women, who are often tasked with getting clean water for the household, forcing them to travel longer distances, leading to musculoskeletal issues, exposure to violence, and exposure to infectious agents. Additionally, she explained how the economic fallout of extreme weather events can lead to forced marriages, which can cause a number of health consequences.

1.10. Does your medical school curriculum address the unequal regional 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: During the Patients Two lecture, “Intro to Social Determinants of Health,” second year medical students learn about the impact of climate change in marginalized communities. The intro lecture specially addresses changes in health based on zip code and regional differences.

Another lecturer presented on the disparate effects of climate change on developing nations in a talk for the Climate Health & Action elective, explaining that droughts may have a disproportionate effect on health in areas that already have a limited supply of fresh water and/or poor infrastructure.

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

1.11. 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: This topic was addressed in the Optional Enrichment Elective on Climate Health & Action from a lecture from the co-director of the Diploma in Climate Medicine at University of Colorado School of Medicine. She explained the increased exposure that women have to environmental toxins globally due to gendered occupational divisions and briefly mentioned reproductive health effects such as increased miscarriage and pregnancy complications. Additionally, another lecturer gave a lecture about the toxic effects of plastic pollution in this Optional Enrichment Elective, and briefly illustrated how plastic pollution can affect fetal development.

1.12. 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: In the Patients Two course for second years, students are exposed to environmental risks in the surrounding Worcester community through their Social Determinants of Health Community Exploration experience.

Through the Optional Elective, Climate Health & Action, students learned about the local climate initiatives being organized by the Greater Boston Physicians for Social Responsibility. The lecturer discussed local power plant projects and the consequent contaminated surrounding neighborhoods. She also described the problem of gas leaks in Massachusetts and the local legislative efforts to minimize their effects on local communities.

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

3	Indigenous knowledge and value systems are integrated throughout the medical school's planetary health education
2	Indigenous knowledge and value systems as essential components of planetary health solutions are included briefly in the core curriculum.
1	Indigenous knowledge and value systems as essential components of planetary health solutions are included in elective coursework.
0	This topic was not covered.

Score explanation: As part of the Optional Elective, Climate Health & Action, a lecturer discussed the unique knowledge that indigenous women have about inter-related issues of poverty, health, water and food systems, energy management and sustainability. She described the importance of including these communities in conversations around climate solutions and amplifying their voices.

1.14. 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, Indigenous 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: Within the Climate Health & Action optional elective, multiple lectures including one on plastic pollution talk and another on air pollution talk discussed the inequitable effects of environmental pollutants on marginalized communities. The first lecture illustrated that plastic pollution is concentrated in poorer areas, while the second talk showed how methane pollution gets concentrated in poor, inner-city neighborhoods.

1.15. 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: In the first year course Principles II, during the Epi-Bio Block, students read and review an article entitled “Healthy Eating and Risks of Total and Cause-Specific Death among Low-Income Populations of African-Americans and Other Adults in the Southeastern United States: A prospective Cohort Study” by Yu, D. et al. As part of the discussion, students were asked “Are there any additional factors related to a changing climate and other environmental exposures that could affect the conclusions of the study? Explain.”

Historically, lectures in the student elective Culinary Medicine touched on the co-benefits of a plant-based diet. Speakers included a vegan restaurant owner, as well as a family medicine physician, and a pediatrician. All speakers indicated the health benefits of a plant based diet, though the ties to climate change were more subtle. Unfortunately these lecturers were not brought in this year but there is the intention to bring back the content next year.

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

Score explanation: The carbon footprint of healthcare is discussed in the Health Systems Science Pathway course which reaches a significant portion of the class, though not the core curriculum for all students.

As part of the Optional Elective, Climate Health & Action, a lecturer from Health Care Without Harm presented to students about the numerous ways in which the healthcare sector both contributes to and is impacted by climate change. Students learned that healthcare contributes 8.5% of total U.S. emissions, that the majority of those emissions are scope 3 emissions, largely from supply chain and pharmaceuticals, and that clinical care is the single largest driver of emissions. Subsequently, students were taught that as clinicians they have opportunities to reduce emissions through using a climate lens to identify low-value, inefficient care and prioritize prevention. Lastly, the lecturer reviewed several organizations such as Health Care Without Harm, Practice Greenhealth, and The Cool Food Pledge, all of which are addressing the footprint of healthcare systems. As part of the same elective, another lecturer also presented on the carbon footprint in her “Climate Change, Dermatology, and Medical Waste” lecture, focusing on ways that physicians and medical students can reduce their carbon footprint, such as cutting back on single-use plastics where it is safe and empirically supported, not putting on gloves unless it is necessary, and performing waste audits.

1.17. Does your <u>medical school</u> curriculum cover these components of sustainable clinical practice in the <u>core</u> curriculum? (points for each)	
2	The health and environmental co-benefits of avoiding over-medicalisation, over-investigation and/or over-treatment
2	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 fulfill this metric.
1	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	Environmental impact of surgical healthcare on planetary health and the climate crisis, and how can it be mitigated
1	The impact of anaesthetic gases on the healthcare carbon footprint and ways to reduce anesthesia environmental impacts, such as total intravenous anaesthesia or choosing less environmentally harmful anaesthetic gas options with reduced greenhouse gas emissions
1	The impact of inhalers on the healthcare carbon footprint and the environmental benefit of dry powdered inhalers over metered dose inhalers.
1	Waste production within healthcare clinics and strategies for reducing waste in clinical activities (e.g. single use items in the inpatient or outpatient setting)
<p><i>Score explanation: UMass Chan does not address most of these topics in its core curriculum. The waste production associated with radiology is discussed in the radiology clerkship taken by all students. There is focus on non-pharmaceutical management of conditions where appropriate within the clinical skills courses, but there is minimal explicit connection made with environmental health.</i></p>	

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?	
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: Although this topic was historically addressed in a student-run lecture given to all third year medical students, this lecture did not occur this year and therefore zero points are being awarded. The medical school does not address this topic in its core curriculum.</i></p>	

1.19. 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.

Score explanation: The UMass Chan “Early Clinical Learning” curriculum that primarily teaches students how to conduct a history includes strategies for taking an environmental history in their 2023-2024 curriculum. The class entitled, “Social History and Social Determinants of Health” teaches students how to ask about a patient’s living arrangement, workplace, and workplace exposures so as to assess their environmental exposure. In a separate class within the same course entitled “Why is my Stomach Killing me?” students work through an undifferentiated case of a young person who has lethargy and confusion as a result of lead poisoning. Considering both of these classes in the required curriculum address elements of environmental history taking, we are awarding two points.

Curriculum: Administrative Support for Planetary Health

1.20. Is your medical school currently in the process of implementing or 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: The University of Massachusetts Chan Medical School is in the process of making significant improvements to planetary health education. Notably, there is a [website](#) dedicated to climate and health education at UMass Chan, which outlines the climate curriculum’s goals and objectives. The website is still growing with next steps involving tagging climate content through each of the preclinical curriculum subjects.

UMass rolled out their new Vista curriculum in 2023, and the “Societal Forces Impacting Health and Disease” longitudinal focus topic has a core domain called “Environmental forces” that will require course directors to address climate change trends, the impact of climate change on health and disease, disaster prevention and preparedness, and environmental justice in each block of their courses throughout the preclinical years. In addition to the faculty committee directly responsible for overseeing the integration of the “Societal Forces Impacting Health and Disease”, there is a Climate Change Curriculum Taskforce that is dedicated to integrating planetary health. This committee has both faculty and student members who communicate directly with course leaders.

1.21. 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.
<p><i>Score explanation: Currently, the topics are well-interspaced into the first-year curriculum including courses in biochemistry (related to exposure to free radicals produced by pollutants), genetics (related to the effect of pollutants on DNA methylation patterns), pulmonary health, epidemiology and biostatistics, with added information in the first semester of the second year curriculum, including topics such as pulmonary pathophysiology. Currently, the majority of the information related to planetary health and climate change is within the first and second year curriculum though efforts are now underway to increase integration throughout the third and fourth years. Given the lack of climate and health education in the third and fourth year curricula as well as the overall lack of mention of several important climate and health topics, we are awarding four points.</i></p>	

1.22. Does your <u>medical school</u> 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?	
1	Yes, the medical school has a specific faculty/staff member responsible for overseeing curricular integration of planetary health and sustainable healthcare
0	No, the medical school does not have a specific faculty/staff member responsible for overseeing curricular integration of planetary health and sustainable healthcare.
<p><i>Score explanation: The aforementioned “Societal Forces Impacting Health and Disease” longitudinal focus topic has a core domain called “Environmental forces”.</i></p> <p><i>In addition there is a Climate Change Curriculum Taskforce that is dedicated to integrating planetary health. This committee has both faculty and student members who communicate directly with course leaders.</i></p>	

Section Total (41 out of 72)	56.94%
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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.*

2.1. Are there researchers engaged in planetary health research and healthcare sustainability research at your <u>medical school</u>?	
3	Yes, there are faculty members at the medical school who have a primary research focus in planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the medical school 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> We carefully reviewed the School of Medicine research network. UMass Medical School has over 300 basic-science faculty in various appointments and over 3100 associated clinical faculty. We were unable to identify faculty at the Medical School whose primary research or interdisciplinary endeavors focused on planetary health and/or healthcare sustainability. Several faculty members have research interests focused on climate change and sustainability. For example, a UMass faculty member has conducted both internal and external research efforts examining climate change and waste reduction in the field of dermatology. Another faculty member is conducting a study using implementation science to assist public health officials and community partners to prepare for the negative health effects of climate change in their communities.</p> <p>One faculty member in the dermatology department has offered students the opportunity the opportunity to participate in a summer research project on environmental sustainability in medicine, examining what measures hospital departments can take to increase their environmental awareness and sustainability. This project included a curriculum of lectures, journal reviews on environmental sustainability, and provided students with an opportunity to shadow clinicians to observe potential areas for sustainable intervention. This faculty member did not mentor any projects in the summer of 2023 but will mentor a research project in the summer of 2024.</p> <p>UMass Medical School is part of a 5-campus system incorporated as the University of Massachusetts. Within the broader University of Massachusetts University System there are institutes and programs whose focuses are on planetary health and healthcare sustainability. One example is the Climate group housed at the Institute of Diversity Sciences at the University of Massachusetts - Amherst campus. This group conducts research that examines the diversity of human impacts and responses in the context of global climate change. Another example is the Sustainable Hospitals Program located at the University of Massachusetts - Lowell campus that promotes research that supports both environmental and patient safety</p>	

with a focus on cancer and asthma prevention. We are not awarding points for researchers at these programs, however, because they are not housed at the medical school.

2.2. 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 University of Massachusetts Chan Medical School has a highly productive research enterprise with a multitude of research departments and collaboratives furthering research to improve human health. There is no dedicated research department on the medical school campus for interdisciplinary planetary health research.

Within the larger UMass university system there are several examples of interdisciplinary institutes focused on planetary health. The University of Massachusetts Amherst campus is home to the [Institute for Diversity Science](#), an interdisciplinary Climate research group composed of over 60 faculty and researchers with the specific mission to “[pursue a wide range of projects that examine the diversity of human impacts and responses in the context of global climate change.](#)” The University of Massachusetts Lowell campus has [The Climate Change Initiative](#) which brings together researchers from across the University to “*catalyze evidence-based climate action through research, education and community engagement.*” One of their research cores focuses on the health impacts of climate change.

While determining this grade and formulating the score explanation, we also considered the tremendous opportunity for further development of interdisciplinary research on planetary health and health care sustainability, especially at the medical school. While the UMass Climate research group contains over 50 members, none of the members listed hold a primary appointment in the School of Medicine.

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 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.
<i>Score explanation: No such process or efforts to create such a process were identified</i>	

2.4. Does your <u>institution</u> have a planetary health website that centralizes ongoing and past research 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.
<i>Score explanation: No unified institutional website dedicated to announcing and communicating resources about Planetary Health or Health Care Sustainability research was identified at the University of Massachusetts. The University of Massachusetts Chan Medical School does have an Office of Sustainability website with some resources and project updates but does not share information about ongoing and past research related to health and the environment.</i>	

2.5. Has your <u>institution</u> recently hosted a conference or symposium on topics related to planetary health?	
4	Yes, the medical school has hosted at least one conference or symposium on topics related to planetary health in the past year.
3	Yes, the institution has hosted at least 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.
<i>Score explanation: UMass Chan Medical School has not hosted a conference related to planetary health in the past three years.</i>	

2.6. Is your <u>medical school</u> a member of a national or international planetary health or ESH

organization?	
1	Yes, the medical school is a member of a national or international planetary health or ESH organization
0	No, the medical school is not a member of such an organization
<p><i>Score explanation: UMass Chan Medical School is currently a member of Practice Greenhealth as an academic partner. We also are a part of the Global Consortium on Climate and Health Education which aims to “unite health professional training institutions, health societies, and regional health organizations to create a global climate-ready health sector, prepared to mobilize and lead health promotion and response in the era of climate change, while restoring the health of the planet.”</i></p>	

Section Total (7 out of 17)	41.18%
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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.*

3.1. Does your <u>medical school</u> 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: During the Population Health Clerkship in the Population-based Urban and Rural Community Health (PURCH) track, medical students are able to work with ReGreen Springfield, an organization that promotes urban tree planting and examines environmental injustice in the Springfield community. Students are able to work alongside organizational leaders during dedicated curriculum time and ultimately present their work back to the larger class as part of the Population Health Clerkship. Similarly, students also have the opportunity to work with "Climate Change and Public Health: Advocacy in Action," during the Population Health Clerkship during which they learned about the health impacts of climate change and how to engage in local climate advocacy. Students met with local environmental advocacy groups (Sierra Club, Climate Code Blue, Elders Climate Action, Gas Leaks Allies, etc) and also local state senator, representative, and local lobbyists to advocate for specific green initiatives.</i></p> <p><i>UMass Chan partners with the Regional Environmental Council in support of a community garden that is now located on the medical school campus. UMass Chan is also partnering with 2Gether We Eat on the Wellness Farm project, which will focus on sustainable, hydroponic urban agriculture, and donation of food to local communities in need. The project will also tie in the university's very first solar array, as well as sustainable landscaping features.</i></p>	

3.2. 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 institution/medical school have not offered such community-facing courses or events.

Score explanation: UMass Chan hosted a Ride and Drive event on October 18th, 2023 which was open to the public. This event offered electric vehicles and electric bicycles for test driving, and multiple community organizations tabled to promote planetary health.

3.3. 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 receive communications about planetary health or sustainable healthcare.

Score explanation: The UMass Chan Medical School Office of Sustainability has a Sustainability Newsletter, which includes sustainability tips and information about efforts on the UMass Chan campus. The Office of Sustainability is also listed on the home page of the university.

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?

2	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.
1	Yes, the institution or main affiliated hospital trust offers one course relating to planetary health and/or sustainable healthcare for post-graduate providers
0	There are no such accessible courses for post-graduate providers

Score explanation: We have not been able to find these resources.

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

2	Yes, the medical school or all affiliated hospitals have accessible educational materials for patients.
1	Some affiliated hospitals have accessible educational materials for patients.
0	No affiliated medical centres have accessible educational materials for patients.

Score explanation: For the purposes of this evaluation, Baystate Health was considered to be an affiliated hospital with UMMS. Both [Baystate](#) and [UMass Memorial](#) have educational materials on environmental exposures within their respective patient information libraries, accessible online. UMass Memorial's patient library specifically discusses mold in the environment, air pollution, carbon monoxide poisoning, lead poisoning, radon, and multiple chemical sensitivity. The asthma section of the patient library also contains a resource on occupational triggers of asthma.

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

2	Yes, the medical school or 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 Baystate Medical Center patient library [links](#) to a resource on climate change through the National Library of Medicine. The UMass Memorial does not have any patient-facing materials about the impacts of climate on health.

Section Total (11 out of 14)	78.57%
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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.*

4.1. Does your <u>medical school</u> or your <u>institution</u> offer support for medical students interested in enacting a sustainability initiative/QI project?	
2	Yes, the medical school or institution <i>either</i> offers grants for students to enact sustainability initiatives/QI projects <i>or</i> sustainability QI projects are part of the core curriculum.
1	The medical school or institution 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 and there is no requirement to participate.
0	No, neither the medical school or the institution offer opportunities or support for sustainability initiatives or QI projects.
<p><i>Score explanation: The UMass Chan Medical School has funding that is allocated to each of the student-led “learning communities,” which has been used to fund sustainability projects such as a Kelley Green Week, an annual events where teams of students can earn points for their “learning community” by making sustainable choices. Funding is also available through the Student Body Committee, which distributes funds to registered student organizations. These funds have sponsored the creation and upkeep of an on-campus community garden and support the UMass Chan Climate Coalition.</i></p> <p><i>Other resources are made available to students through grant applications. While not specifically for sustainability initiatives, students may use them for projects to further sustainability work. One example of a grant available to students is the MLK Jr. Semester of Service Student Award, which supports student-driven service projects in the communities that surround the UMass Worcester campus.</i></p>	

4.2. Does your <u>institution</u> offer opportunities for medical students to do research related to planetary health and/or sustainable healthcare?	
2	The institution has a specific research program or fellowship for students interested in doing planetary health/sustainable healthcare research.
1	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.
0	There are no opportunities for students to engage in planetary health/sustainable healthcare research.

Score explanation: While there are groups of individuals conducting research that relates to planetary health at UMass Medical School, there is no institutional advertisement of the projects that are being conducted. Students interested in getting involved in climate related research must seek out these opportunities through mentorship, the Office of Sustainability, or connecting with the student-led Climate Coalition.

4.3. 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 UMass Chan Medical School has an [Office of Sustainability](#) website that is update with current UMass Chan Medical School sustainability initiatives, ideas for faculty, students and staff to go green, the 2021-2026 Climate Action Plan, and contact information for those who want to get involved.

4.4. Does your medical school have 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 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 .
0	No, there is not a student organization at my institution dedicated to planetary health or sustainability in healthcare.

Score explanation: The [UMMS Climate Coalition](#) is a funded student organization with faculty support dedicated to supporting planetary health and sustainability in healthcare.

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

1	Yes, there is a student representative that serves on a medical school or institutional decision-making council/committee.
0	No, there is no such student representative.
<p><i>Score explanation:</i> <i>The UMass Chan Medical School Sustainability and Climate Action Plan for 2021-2026 called for three focus groups to be created: Grounds and Transportation, Materials and Management, and Buildings and Energy. Each of the three groups are accessible to medical students and any member of the UMass Chan community who is interested in brainstorming ideas in supporting sustainable solutions in the areas of focus, and actively recruit medical students . These meetings are run by the Office of Sustainability in the Facilities Department.</i></p> <p><i>UMass Chan Medical School is finishing its transition to a new curriculum model (VISTA curriculum). The school established a climate change curriculum taskforce whose mission is to include, highlight, and integrate climate topics into each of the 9 blocks of the preclinical medical education years. Each of the 9 blocks has a student and faculty representative tasked with researching current climate topics in the curriculum and working to further add climate based topics to their respective blocks.</i></p>	

4.6. In the past year, has the <u>institution</u> had one or more co-curricular planetary health programs or initiatives in the following categories? (1 point each)	
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)
<p><i>Score explanation:</i></p> <ul style="list-style-type: none"> <i>The Community Garden Interest Group at UMass Chan Medical School runs a community garden located behind the medical school. They provide fresh produce to the greater UMass community and allow students to participate in planting and harvesting of crops. They recently expanded to include perennials in their garden, including berry bushes.</i> <i>The UMMS Coalition for Climate Action leads several planetary health related events per semester, all of which are geared toward student learners. The Coalition for Climate Action also have continued their Climate Health and Action elective, a focused speaker series on the intersection of healthcare</i> 	

and planetary health for students for credit. Students usually have the opportunity during the Population and Community Health Clerkship titled “Climate Change and Public Health: Advocacy for Action” to directly interface with multiple local branches of environmental justice organizations, including Climate Code Blue, Gas Leaks Allies, local branches of the Sierra Club, Elders Climate Action, among others. Several of these groups, such as Climate Code Blue, specifically focused on how the medical community can get involved in Massachusetts-based environmental justice advocacy. Due to curriculum changes, this clerkship was not offered this year but will in the future.

- *There are several wilderness or outdoor programs offered: The Wilderness Medicine elective teaches students how to deal with medical emergencies in the wild by leading hikes and other outdoor experiences. There is also a UMass Medical hiking club that sponsors hiking and wellness walks.*
- *The Office of Sustainability puts on Earth Month events that are climate-focused volunteering in the local community, including park clean-ups, development of UMass into a pollination campus, and more. Volunteering initiatives such as Water-Safe Worcester, focused on mitigating the impacts of high heat by teaching individuals water safety, have also been developed by the students.*

Section Total (11 out of 15)

73.33%

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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.*

5.1. Does your <u>medical school</u> and/or <u>institution</u> 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 Massachusetts Chan Medical School has an Office of Sustainability with two full time employees - one Sustainability and Energy Manager and one Associate Director of Sustainability & Campus Services. The Office of Sustainability is specific to the UMass Medical School campus but does collaborate with the sustainability offices of other UMass campuses for institution-wide initiatives and Earth Week celebrations. The medical school has recently established a Climate Change Curriculum Taskforce composed of teaching faculty and students.</i></p>	

5.2. How ambitious is your <u>institution/medical school</u> plan to reduce its own carbon footprint?	
5	The institution/medical school has a written and approved plan to achieve carbon neutrality by 2030
3	The institution/medical school has a written and approved plan to achieve carbon neutrality by 2040
1	The institution/medical school has a stated goal of carbon neutrality by 2040 but has not created a plan to reach that goal or the plan is inadequate
0	The institution/medical school does not meet any of the requirements listed above
<p><i>Score explanation: The UMass Chan Medical School Office of Sustainability has stated a goal of reducing Scope 1 and Scope 2 greenhouse gas emissions by 15% by 2026 and has a detailed 5-year plan to achieve this goal which includes supporting replacement of inefficient HVAC</i></p>	

equipment, recommissioning existing building systems, and increasing use of a heat exchanger. The UMass system, of which the medical school is a part of, has a commitment to achieving climate neutrality by 2050. During 2023, UMass underwent the decarbonization planning process with ARUP Engineering and GreenerU to meet compliance with Executive Order 594 issued by the MA state legislature, a statewide initiative to reach carbon neutrality by 2050. Since the system-wide carbon neutrality goal is stated to occur after 2040, we awarded the institution no points in this category.

5.3. 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.

Score explanation: In 2020, UMass Chan completed a solar study to evaluate the potential for on-site renewable energy production at its main campus. The study determined that on-site would provide marginal economic benefit. However, the institution is exploring opportunities to align renewable energy installations with LEED certification of new construction, as well as potential off-campus installations. The construction of a new academic research building and associated geothermal system will be completed in 2024. Over the course of a year, the geothermal system is anticipated to provide 88% of the heat for offices, laboratories, and educational and public spaces and provide 50% of the cooling needs for the building. Approximately, 10% of UMass's energy requirement is purchased from the grid of which the gridmix is greater than 16% renewable.

5.4. 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 sustainability rating system or 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.

Score explanation: Sustainable building practices are utilized for new buildings. Construction of a new research building is set to be completed this year. The new research building will be partially powered by a 75 well geothermal system. The target for this building is LEED gold and will contain sustainability features such as LED occupancy censored lighting and specialized solar reflective paint. The next most recently constructed building, the Albert Sherman Center, is LEED gold and was

designed with sustainability in mind. The building was designed for thermal optimization and 95% of the steel that was used was made from recycled material. The medical school follows “LEED plus 2.0” building standards for new constructions as required by MA executive order 594. Extensive recommissioning has been undertaken, but no buildings have been completely retrofitted.

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

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

Score explanation: Many students live close to campus and choose to walk, although single occupancy vehicles remain the primary means of student transportation. There are currently 96 electric vehicle charging ports on campus. UMass has developed a variety of incentives to encourage commuting by bike. Covered bicycle parking is located in the parking garages and bike racks are available outside most occupied buildings. Additionally, the new bicycle registry allows cycling commuters to use locker and shower facilities. There is a shuttle system in place however it is not electrified. The Worcester Regional Transit Authority serves the UMass campus and connects to all major local routes in addition to connecting to the local commuter rail stop for access to Boston. There are two bus stops on campus and the university offers travel training to educate new riders on how to make use of the public transportation system. Employees can also choose to carpool, for which they would be able to split the cost of one parking permit and access parking spots that are closer to the entrance. The student learning communities sponsor a “Go Green Challenge” one to two times per year which encourages carpooling amongst students.

5.6. 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: UMass Chan Medical School does not currently have a composting program. The school does have a recycling program, but the bins are not always easily accessible or conveniently placed. However, the Office of Sustainability has implemented periodic waste audits to identify ways to remediate obstacles to recycling.

5.7. Does the medical school apply sustainability criteria when making decisions about the campus food and beverage selections (e.g. local sourcing, reduced meat, decreased plastic packaging)?

3	Yes, the medical school has adequate sustainability requirements for food and beverages, including meat-free days or no red-meat, and is engaged in efforts to increase food and beverage sustainability.
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.

Score explanation: Sustainable food purchasing requirements are included in the contract language with the UMass food provider, NexDine. Specific language includes “maximizing the purchase and utilization of foods within a 200-mile radius of Worcester, minimizing waste, and prioritizing the use of plant-based foods”. NexDine filters cooking oil to reduce overall usage by 35%. The on-campus Albert Sherman Center dining facility is the only Green Certified Restaurant in the Worcester area and hosts “Meatless Mondays” weekly. In the summer of 2023, UMass offered community supported agriculture shares to the community which resulted in 80+ shares being distributed. There is also a student-run community garden which was expanded in 2022. The student food pantry also partners with local farms to provide fresh local produce to students.

5.8. Does the medical school or 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.

Score explanation: Score explanation: The UMass Sustainability Council is collaborating with the Unified Procurement Services Team to receive better data to measure success in procuring more environmentally responsible supplies and resources across all UMass campuses using the AASHE STARS data framework. In the 2021-2026 Sustainability and Climate plan, the university sets a goal to implement environmentally preferable purchasing guides and standards. To achieve this, a series of strategies are outlined to integrate sustainability language into purchasing documents, support sustainable lab materials purchasing, procuring electric vehicles, and increase partnership with sustainability purchasing organizations.

5.9. Are there sustainability requirements or guidelines for events hosted at the <u>medical school</u> ?	
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: There are currently no sustainability requirements or guidelines for events hosted at or through the medical school. The UMMS Sustainability Plan includes plans to develop a sustainable event guide, but those steps have only begun recently.</i></p>	

5.10. Does your <u>medical school</u> 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: There is a chemical exchange program for unopened chemicals still in good condition to reduce waste of unused chemicals. Additionally, the Office of Sustainability has an ongoing “shut the sash” campaign that encourages lab members to lower the sashes of fume hoods to reduce energy usage. The UMMS Sustainability plan outlines that UMass Chan will extend support for more sustainable procurement practices of laboratory chemicals, of ice supplies, electronics, and other goods by 2023 but actions have not yet been to achieve this goal. There have been two “Green Lab Summits” hosted by the Sustainability Office in 2023 but no actions have been taken yet.</i></p>	

5.11. Does your <u>institution’s</u> 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	The institution is entirely divested from fossil fuels.
2	The institution has partially divested from fossil fuel companies or has made a commitment to fully divest , but currently still has fossil fuel investments.
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.

Score explanation: UMass has completely divested from both coal and fossil fuels for all directly held shares. We are categorizing this as a partial divestment given that indirect endowment holdings or endowment holdings not directly held by UMass may still include investment in fossil fuels.

Section Total (17 out of 32)

53.13%

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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 University of Massachusetts Chan School of Medicine

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

Section	Raw Score %	Letter Grade
Planetary Health Curriculum (30%)	$(41/72) \times 100 = 57\%$	C+
Interdisciplinary Research (17.5%)	$(7/17) \times 100 = 41\%$	C-
Community Outreach and Advocacy (17.5%)	$(11/14) \times 100 = 79\%$	B+
Support for Student-led Planetary Health Initiatives (17.5%)	$(11/15) \times 100 = 73\%$	B
Campus Sustainability (17.5%)	$(17/32) \times 100 = 53\%$	C
Institutional Grade	$(.57 \times 0.3 + .41 \times 0.175 + .79 \times 0.175 + .73 \times 0.175 + .53 \times 0.175) = 60.2\%$	B-

Report Card Trends

Section Overview

This graph demonstrates trends in overall and section grades for the years in which UMass Chan School of Medicine has participated in the Planetary Health Report Card initiative.

Planetary Health Report Card Trends for UMass Chan Medical School

