



Planetary Health Report Card (Medicine):

Mayo Clinic Alix School of Medicine - MN



MAYO CLINIC COLLEGE
OF MEDICINE AND SCIENCE

2023-2024 Contributing Team:

- Students: Grant Welk*, Kathryn Xu, Richard Roden
- Faculty Mentors: Dr. Molly Herr
- *Primary Contact: Grant Welk, welk.grant@mayo.edu

Summary of Findings

Overall	C
<u>Curriculum</u>	C
<ul style="list-style-type: none"> The effects of climate change on health are briefly mentioned throughout the curriculum, which is where many of the points for this section were gained. However, in depth coverage of these issues is not provided, and the inclusion of climate change material would be much more effective if distributed throughout the organ blocks rather than in the longitudinal FRAMES curriculum. Recommendations: We recommend adding additional depth to the curriculum to expand on the effects of climate change on human health, and incorporating this content into specific organ blocks.. 	
<u>Interdisciplinary Research</u>	C+
<ul style="list-style-type: none"> Mayo Clinic has engaged in some research activities pertaining to planetary health and hosted a conference that included discussion of the subject in 2020. However, there is not a clearly sustained focus on planetary health research or an organized database for collaborative opportunities. Recommendations: Mayo Clinic Alix School of Medicine could organize a conference directly related to Planetary Health and organize resources to help students identify sustainability-related opportunities. They could also join the Planetary Health Alliance and the Global Consortium on Climate and Health Education. 	
<u>Community Outreach and Advocacy</u>	B
<ul style="list-style-type: none"> Mayo Clinic Alix School of Medicine has negligible community outreach relating to planetary health. As an institution, Mayo Clinic has organized a handful of community-facing events about environmentalism, and there are some patient education handouts that are marginally related to this topic. Recommendations: Include more community partnerships related to planetary health, specifically at the medical school level. 	
<u>Support for Student-Led Initiatives</u>	C
<ul style="list-style-type: none"> The Mayo Clinic Alix School of Medicine itself provides very little support for student-led sustainability related initiatives. On the institutional level, there are programs such as the Green Advocate program that allow employees of the Mayo Clinic to become involved in sustainability efforts around the clinic; however, these are poorly publicized. Recommendations: MCASOM could distribute an email at the beginning of the academic year informing new and current students about the Green Advocate program. Additionally, the school could include links to Mayo's sustainability efforts and research opportunities directly on the medical school webpage. 	
<u>Campus Sustainability</u>	D
<ul style="list-style-type: none"> The Mayo Clinic institution has adopted several initiatives for improved campus sustainability, primarily focused around reducing energy consumption and unnecessary waste. However, there is limited investment in renewable energy and no current plans for carbon neutrality, even with future development plans. No staff represent the medical school specifically in the area of sustainability. Recommendations: Mayo Clinic Alix School of Medicine could appoint a sustainability representative within the medical school and establish medical school specific sustainability guidelines for events and procurement. We recommend that the Mayo Clinic institution adopt more aggressive climate goals, including goals for carbon neutrality and encourage advocacy and movement toward oil and gas divestiture. 	

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 minimizes 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 year, 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: A longitudinal 20-hour Sustainability in Medicine Selective was started and is offered virtually to medical students at the Mayo Clinic Alix School of Medicine Arizona/Rochester campuses, encompassing various topics in medical sustainability like managing medical waste and operational efficiency. This elective includes a one-hour monthly seminar from October through July, with the remaining hours dedicated toward working with the Mayo Clinic Green Committee on a quality improvement project.</i></p> <p><u><i>Selected Sustainability Selective Lecture Topics:</i></u></p> <ol style="list-style-type: none"> 1. Drug recycling/medication re-dispensing 2. Going green in the operating room 3. Electric ambulances 4. Energy efficient hospitals/solar panels for hospitals 5. Disaster preparedness and climate resilience 6. Cultural competence in healthcare professionals 7. Harm reduction support 8. Pain management alternatives 9. Food as medicine 	

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: There are multiple lectures that discuss this topic throughout the 4-year curriculum. There was a 2023 lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.”</i></p> <p><i>One slide states “The link between climate change and health is undeniable. Climate change impacts the health of our patients and our communities, with communities of color and women being affected the most...In the Pacific Northwest in the last five years we have encountered: - Record heatwaves in 2021 that killed over 1,000 people in OR, WA, and BC. - The largest wildfires seen in the state of Oregon - over 1M acres burned in 2020. Our hospital nearly had to be evacuated... Climate change leads to: - Spread of disease (infectious, cardiovascular, etc.), displacement and mental health crisis - Supply chain disruption (inability to meet mission) - Infrastructure disruptions (road closures, hospital evacuations) - Massive insurance losses.” Of note, the lecture focused on climate impacts in the lecturer’s area of work, but not in the local Minnesota area.</i></p> <p><i>There was also a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave. This session discussed the “average of 700 heat related deaths/yr in the US.”, increased frequency of extreme weather events with climate change, the heatwave’s impact on the local health system, and what physicians can do about climate change more broadly.</i></p>	

1.3. Does your <u>medical school</u> curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
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: There are multiple lectures that discuss this topic throughout the 4-year curriculum. There was a 2023 lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.” Only two slides out of 13 discuss impacts of extreme weather events on individual health/and or healthcare system.</i></p> <p><i>One slide states “The link between climate change and health is undeniable. Climate change impacts</i></p>	

*the health of our patients and our communities, with communities of color and women being affected the most...In the Pacific Northwest in the last five years we have encountered: - Record heatwaves in 2021 that killed over 1,000 people in OR, WA, and BC. - The largest wildfires seen in the state of Oregon - over 1M acres burned in 2020. Our hospital nearly had to be evacuated... Climate change leads to: - Spread of disease (infectious, cardiovascular, etc.), displacement and mental health crisis - Supply chain disruption (inability to meet mission) - **Infrastructure disruptions (road closures, hospital evacuations) - Massive insurance losses.**”*

The 2nd slide discusses the inequitable impact of Climate change on communities of color, but does not directly discuss the impacts of climate change on health or healthcare systems

However, there was also a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave. The presentation described the universal impact but disproportional impact that heat had on the following populations: “Children, Elderly, People of color, Homeless, Outdoor workers, People living in poverty, People with heart or respiratory diseases, and People taking diuretic medications”

It also discussed how Climate disasters like the heatwave can easily overwhelm health on hospitals/health system, specifically identifying that:

- *“Heat related illness ED visits for June 2021 were 7x higher than June 2019 and ED visits from June 25-30, 2021 were 69x higher than same days in 2019,*
- *There was an excess 600 weekly deaths in WA and OR, and in WA, that was higher than during WA’s winter 2020-21 Covid surge*
- *Multiple OR closures occurred due to high humidity, since patient rooms and AC systems were not designed for heat or humidity”*

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: There was a lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.”

*In the lecture, it was briefly mentioned that climate change increases the prevalence of a number of conditions. One slide states “The link between climate change and health is undeniable. Climate change impacts the health of our patients and our communities, with communities of color and women being affected the most... **Climate change leads to: - Spread of disease (infectious, cardiovascular, etc.)....**”*

There was also a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave. In this session, it was also discussed that climate change increased the prevalence of a number of conditions listed below, however, infectious disease was only briefly mentioned and the specific patterns of infectious disease were not examined.

“Heat:

*MI’s, CHF, COPD, deaths
Domestic abuse, homicides;
depression and suicide rates;
Premature births (Inc 5% on 90o+)
Chronic renal insufficiency
Floods and droughts:
Food insecurity;
Contaminated water; food*

Allergens:

*seasonal allergies/asthma
Air pollution: WHO 7 million premature deaths/yr; PM2.5*

Infectious diseases:

Lyme, Zika, cholera, West Nile Virus, algal blooms”

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: There was a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave. In this session, it was also discussed that climate change increased the prevalence of a number of conditions listed below, however, respiratory allergens/asthma were only briefly mentioned and the other respiratory health burdens were not examined.

“Heat:

*MI’s, CHF, COPD, deaths
Domestic abuse, homicides;
depression and suicide rates;
Premature births (Inc 5% on 90o+)
Chronic renal insufficiency
Floods and droughts:
Food insecurity;
Contaminated water; food*

“Allergens:

*seasonal allergies/asthma
Air pollution: WHO 7 million premature deaths/yr; PM2.5”*

Infectious diseases:

Lyme, Zika, cholera, West Nile Virus, algal blooms”

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: There was a lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.” One slide states “The link between climate change and health is undeniable... Climate change leads to:... - **Spread of disease (infectious, cardiovascular, etc.), displacement and mental health crisis.**” However, cardiovascular disease was only briefly mentioned and the specific cardiovascular burdens were not examined.*

There was also 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave. In this session, it was also discussed that climate change increased the prevalence of a number of conditions listed below, however, cardiovascular health effects were only briefly mentioned.

“Heat:

MI’s, CHF, COPD, deaths

Domestic abuse, homicides;

depression and suicide rates;

Premature births (Inc 5% on 90o+)

Chronic renal insufficiency

Floods and droughts:

Food insecurity;

Contaminated water; food”

*Additionally, there was a lecture on Climate & Health Policy Solutions to the Climate Crisis. One slide states that “**PM 2.5 increases cardiovascular morbidity and mortality** (American Heart Assn), diesel exhaust is linked to lung cancer risk (IARC), and in 2013 [air pollution] contributed to an estimated 2,000-4,000 deaths, 500 hospital stays, 800 ER visits in Minnesota”*

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: There was a lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.” One slide states “The link between climate change and health is undeniable... Climate change leads to:... - Spread of disease (infectious, cardiovascular, etc.), **displacement and mental health crisis**” However, however, mental health impacts were only briefly mentioned and specific mental health burdens related to environmental degradation were not closely examined.*

The longitudinal psychiatry and Disruptions in Development curriculum which address mental healthcare and neuropsychological aspects of medicine both covered a variety of topics, however, the effect of environmental degradation and climate change was not one of them. Topics that were addressed involved the legalization of recreational drugs, discussions of obesity in medicine, thoughts and feelings around anatomic dissection and body donation, and disability justice.

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: This is not covered in the core curriculum at the Mayo Clinic Alix School of Medicine in Minnesota. However, a longitudinal 20-hour [Sustainability in Medicine Selective](#) was started and is offered virtually to medical students at the Mayo Clinic Alix School of Medicine Arizona/Rochester campuses, encompassing various topics in medical sustainability like managing medical waste and operational efficiency. This elective includes a one-hour monthly seminar from October through July, with the remaining hours dedicated toward working with the Mayo Clinic Green Committee on a quality improvement project. Though this selective primarily focuses on healthcare system sustainability, there are sessions on Disaster preparedness and climate resilience and Food as medicine that explore this topic.

Selected Sustainability Selective Lecture Topics:

- 1. Drug recycling/medication re-dispensing*
- 2. Going green in the operating room*
- 3. Electric ambulances*
- 4. Energy efficient hospitals/solar panels for hospitals*
- 5. Disaster preparedness and climate resilience*
- 6. Cultural competence in healthcare professionals*
- 7. Harm reduction support*
- 8. Pain management alternatives*
- 9. Food as medicine*

In addition, this topic is covered in the 20-hour Investigating Native Health Through Documentary selective, which explores topics in Native health through watching various documentary films. The topics covered include:

- *Stereotypes of Native American populations in film*
- *Social determinants of health & policy*
- *Food sovereignty*

- *Significance of water*
- *Substance use and mental health*
- *Traditional medicine*
- *The impact of pipelines*
- *The consequences of polluted water on indigenous communities*

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: There was a lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity.” One slide states “Climate justice recognizes that climate change will disproportionately affect communities of color; those with lower incomes, women, and other marginalized populations. Climate change will widen the gap of inequality that already exists for these communities and further threaten their health, housing, food availability, and other vital support systems and social determinants of health. Climate disasters threaten our ability to achieve our mission of improving the health of our members and the communities we serve. In these environments, those with more resources are better able to access health care, worsening disparities.”

There was also a lecture entitled “Science of the Sacred-Bridging Western & Traditional Knowledge Concepts in Medicine and Practice” which covered topics related to health equity and climate change.

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: There was a lecture on Climate & Health Policy Solutions to the Climate Crisis that discussed ongoing issues, inequities, and policy development related to climate change, with a focus on Minnesotans. One slide listed the following social factors that limit resilience when extreme weather events occur:

- *living in poverty*
- *living in an area of concentrated poverty and/or racially segregated housing*
- *having an underlying chronic health condition or disability*
- *language barrier*

- housing instability
- being unemployed having lower levels of education

However, the curriculum lacks discussion on regional or global inequities to climate change impacts.

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: The 20-hour [Rural Medicine Selective](#) discusses common health issues affecting rural populations in the Midwest and Southeastern Minnesota who in particular have a close connection to the natural environment. This selective includes a session discussing occupational hazards of raising livestock and farming leading to exposures to pesticides, zoonotic diseases, injuries, and infections. However, this selective does not focus on climate change or how planetary health impacts individual health, and reproductive-specific health effects were only briefly mentioned.

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: There was a lecture on Climate & Health Policy Solutions to the Climate Crisis that discussed ongoing issues, inequities, and policy development related to climate change, with a focus on Minnesotans. One slide stated that “Extreme heat, severe storms and flooding, wildfires, drought, vector-borne diseases, and air pollution are increasingly impacting the physical and mental health of Minnesotans.” Another slide specifically discussed how “Intense rain events, drought, etc. affect farming economy and the health and mental health of Minnesota farmers” and how the “Location of toxic waste and industrial sites in communities of color places their health at risk from routine chemical emissions, as well as from extreme weather events.”

The 20-hour [Rural Medicine Selective](#) also discusses common health issues affecting rural populations in the Midwest and Southeastern Minnesota who in particular have a close connection to the natural environment. This selective includes a session discussing occupational hazards of raising livestock and farming leading to exposures to pesticides, zoonotic diseases, injuries, and infections. However, this selective does not focus on climate change or how planetary health impacts individual health.

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: Although it has been discussed in prior years (2022), indigenous knowledge and value systems were not recently included in the core curriculum. This topic is peripherally discussed in the 20-hour [Investigating Native Health Through Documentary Selective](#), which explores topics in Native health through watching various documentary films. The topics covered include:

- *Stereotypes of Native American populations in film*
- *Social determinants of health & policy*
- *Food sovereignty*
- *Significance of water*
- *Substance use and mental health*
- **Traditional medicine**
- *The impact of pipelines*
- *The consequences of polluted water on indigenous communities*

There is additionally a selective rotation with [Winslow Indian Healthcare](#) in Winslow, AZ, which allows students to “learn about Native American health, family medicine, rural medicine and/or neurology at the Winslow Indian Healthcare Center (WIHCC), which proudly serves eight-chapter communities in the Southwest region of the Navajo Nation, caring for an estimated 190,000 Native Americans.” However, both of these selective opportunities do not directly educate students on the importance of Indigenous knowledge and value systems as essential components of planetary health solutions.

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: There are multiple lectures that peripherally discuss this topic throughout the 4-year curriculum, however, greater focus to environmental toxins specifically could be improved upon. There was a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021

Pacific Northwest Heatwave. The presentation described the universal impact but disproportional impact that heat and forest fires had on the following populations:

- *Children*
- *Elderly*
- *People of color*
- *Homeless*
- *Outdoor workers*
- *People living in poverty*
- *People with heart or respiratory diseases*
- *People taking diuretic medications*

However, environmental toxins were not specifically discussed in this lecture.

There was also lecture on Climate & Health Policy Solutions to the Climate Crisis that discussed ongoing issues, inequities, and policy development related to climate change, with a focus on Minnesotans. One slide listed the following social factors that limit resilience when extreme weather events occur:

- *living in poverty*
- *living in an area of concentrated poverty and/or racially segregated housing*
- *having an underlying chronic health condition or disability*
- *language barrier*
- *housing instability*
- *being unemployed having lower levels of education*

Another slide also discussed underlying racial disparities in health in Minnesota in relation to air pollution and climate change. It specifically noted that, “Compared to white Minnesotans, Minnesotans who are Black Indigenous, or people of color experience:

Higher incidence of:

- *Infant and maternal mortality*
- *Heart disease*
- *Cancer*
- *Asthma*
- *Diabetes and other chronic illnesses*

Shorter life expectancy

- *Average lifespan is 81 years for white Minnesotans, 78 years for Black, 68 years for American Indian Minnesotans*
- *Black and American Indian infants are twice as likely to die before first birthday than white infants”*

Curriculum: Sustainability

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.
<p><i>Score explanation: No evidence of this information being provided in the GI/Nutrition course nor any other part of the core curriculum. The director of the GI curriculum is well-known as a plant-based diet advocate, however, there are no core educational materials that tie together the environmental and health impacts of eating plant-based.</i></p> <p><i>However, there is a Nutritional Medicine Selective offered, which “aims to narrow the gap [between the lack of nutrition education provided in the traditional medical school curriculum] by providing students a low-stress environment to complete online nutrition modules and in-person cooking sessions ... to better understand how culinary medicine is related to the areas of cardiovascular disease, diabetes, pediatrics, and cancer” However, this does not directly discuss the environmental benefits of a plant-based diet.</i></p>	

1.16. Does your <u>medical school</u> 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.
<p><i>Score explanation: There are multiple lectures that discuss this topic throughout the 4-year curriculum. There was a lecture as part of the Anti-Racism, Diversity, Equity and Inclusion mandatory curriculum which was entitled “Climate Change as a Public Health Crisis and Impact on Health Equity” One slide in the lecture states how 8% of GHG emissions in the US are due to healthcare sector activities. There are six other slides which outline how the healthcare sector might contribute to climate change as well as ways that the lecturer’s organization is working to limit its carbon footprint.</i></p> <p><i>There was also a 2023 Case Study Session in the mandatory curriculum that specifically looked at the 2021 Pacific Northwest Heatwave and Climate Change impacts. One slide stated that “US Healthcare is responsible for 10% of US’s GHG emissions and 27% of world’s healthcare GHG emissions.” It also noted the following:</i></p> <ul style="list-style-type: none"> • <i>“If the US healthcare sector was a country, it would rank 13th in the world (2)</i> • <i>ORs produce 25-30% of total hospital waste (3)</i> • <i>One routine surgery produces as much garbage as a family of 4 in one week (4)</i> <ul style="list-style-type: none"> - <i>Potential savings hospitals could have (\$20,060 per operating room) if green initiatives are introduced”</i> 	

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:</i></p> <p><i>1) The Disruptions in Development Curriculum discussed the harms of over-prescribing but the environmental effects were not discussed. In addition, the benefits of lifestyle interventions on health were discussed but not in relation to their climate impacts.</i></p> <p><i>The Science of Healthcare Delivery core curriculum included sessions on high-value care which discussed the importance of utilizing resources effectively. Although they focused on cost savings and benefits to health, slides from sessions included the following discussion of environmental benefits of this approach:</i></p> <ul style="list-style-type: none"> - 3) "ORs produce 25-30% of total hospital waste. One routine surgery produces as much garbage as a family of 4 in one week. - 4) The Environmental Footprint of Anesthesia / N2O Impact is 6x Worse than all VAs combined" <p><i>These core curricular materials are also supplemented by the 20-hour Sustainability in Medicine Selective that discusses Drug recycling/medication re-dispensing, Going green in the operating room, Electric ambulances, and Energy efficient hospitals/solar panels for hospitals.</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: No evidence of anything being taught about how to discuss the health effects of climate change with patients. Although we did not have formal strategies on discussing climate change with patients taught, simulated patient encounters included patients with concerns about environmental exposures.</i></p>	

1.19. In training for patient encounters, does your <u>medical school's</u> curriculum introduce strategies for taking an environmental history or exposure history?	
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: In the FRAMES curriculum students are taught to take a full history which includes asking about occupational exposures, pets, etc. Simulated patient encounters also included patients with concerns about environmental exposures and exposure-exacerbated asthma. However, despite this being a full score, more can be done as the curriculum does not necessarily include information about more climate-change based factors such as wildfire smoke, etc.</i></p>	

Curriculum: Administrative Support for Planetary Health

1.20. Is your <u>medical school</u> currently in the process of implementing or improving Education for Sustainable Healthcare (ESH)/planetary health education?	
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.
<p><i>Score explanation: There has been discussion among students with some faculty members regarding the importance of climate change as a public health issue and efforts have been made to improve the</i></p>	

curriculum. As part of these discussions, the 20-hour [Sustainability in Medicine Selective](#) was developed this last year. Additionally, presentations to the curriculum committee were receptive and meetings are scheduled to discuss ways of reviewing and incorporating climate change-related curricular elements. However, specifics vary from subject to subject and there is no concrete plan set to change the curriculum as it relates to ESH/planetary health

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.

Score explanation: There is minimal coverage of ESH/Planetary Health in the core curriculum and all of the curriculum is in essentially in standalone "Special Topics" lectures and elective coursework. In review of the curriculum, this appears to be a central inadequacy, as content covered in standalone lectures can vary significantly year-to-year and is not reinforced over time.

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

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.

Score explanation: No evidence on Mayo Clinic websites for a dedicated faculty or staff member who is responsible for overseeing curricular integration of planetary health and sustainable healthcare. Also no recollection from students of such an individual.

Section Total (37 out of 72)

51.39%

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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:

Mayo Clinic does not have any public-facing online curricular materials that reference planetary health, sustainable healthcare, or the intersections of climate change and health. The curricular discussions on the publicly available website are available [here](#). Course materials are broken down by year but there is no mention of planetary health materials nor any reference to any selectives that cover this material.

Mayo Clinic Alix School of Medicine offers a number of student-led [Selective Programs](#) that explore various topics in healthcare. These are 20-hour “elective” opportunities that supplement the core curriculum.

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: There are no planetary health or healthcare sustainability research initiatives listed in the research division of Mayo Clinic. There is an Office of Sustainability at Mayo Clinic but its function appears to operate at the administrative and business level. The link to access information about the operations of the Office of Sustainability is on the internal intranet here.</i></p> <p><i>There are faculty members involved with studies on planetary health, environmental exposure, and healthcare sustainability research, including the Well-Living Lab collaboration, however, information on ongoing environmental research is not compiled in an easily accessible format.</i></p>	

2.2. Is there a dedicated department or institute for interdisciplinary planetary health research at your <u>institution</u>?	
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: There are no divisions, departments or laboratories that focus on environmental issues, sustainability or planetary health. The clinic does have an [occupational medicine department](#).

There are faculty members involved with studies on planetary health, environmental exposure, and healthcare sustainability research, including the [Well-Living Lab](#) collaboration, however, there is no dedicated research institute or department.

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.

Score explanation:

Mayo has a [Research Information Center](#) where the general public may learn and give input about the decision and research agenda at Mayo clinic. Mayo's Center for Individualized Medicine and the The Integrating Special Populations Program also have a [Community Advisory Board](#) and [Pediatric Advisory Board](#), respectively to incorporate input on the direction of institutional research. However, these boards are not dedicated or geared specifically toward environmental issues.

2.4. Does your institution 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.

Score explanation:

Mayo clinic has an [Environmental Stewardship site](#) which provides centralized information about current environmental goals and provides links to the needs assessment reports used to determine the goals. The needs assessment reports provide more information about the initiatives proposed to achieve those goals on an individual campus basis. However, there is no information about upcoming events, leaders in planetary health or relevant funding opportunities.

2.5. Has your institution 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.

Score explanation:

Mayo Clinic hosts an annual [Holistic Health and Well-Being Conference](#) which discusses planetary health principles.

Additionally, Mayo Clinic hosts numerous CME courses, Grand Rounds, and conferences across different specialties, including in Infectious Diseases, Allergy and Immunology, and Ophthalmology that sometimes connect with planetary health principles. However, these are not focused on planetary health.

2.6. Is your medical school 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

Score explanation: Mayo Clinic has is a member of the national organization [Practice Greenhealth](#) and has conducted various research initiatives with the same group

Section Total (10 out of 17)

58.82%

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Community Outreach and Advocacy

Section Overview: *This section evaluates medical school engagement in community outreach and advocacy efforts associated with planetary health. Researching and teaching planetary health is necessary but not sufficient. It is critical that institutions also directly engage with communities most affected by environmental health harms. Although climate change is a problem largely created by those with power and resources, its impacts fall disproportionately on under-resourced populations and communities of 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 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: MCASOM collaborates with the Zumbro Valley Medical Society, a local society for physicians in southern Minnesota. Medical students have the opportunity to join various committees, one of which is the Eco-Public Health Committee. MCASOM additionally collaborates with the Landing (Free Clinic), Christ United Methodist Church (Culinary Medicine), and the ASU/Barrett and O'Connor Washington Center (Advancing Health Equity) Although not always directly related to climate change, principles throughout emphasize health disparities, local environments, and sustainability. There is still room for dedicated environmental-partnerships from the medical school, however.</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.
<p><i>Score explanation:</i></p>	

Mayo Clinic as an institution has hosted a couple of virtual events open to the public through the Office of Sustainability. Both of these events focused on ways in which Mayo is working to reduce its environmental impact. [One](#) describes how Mayo has joined the Better Climate Challenge, an initiative to reduce greenhouse gas emissions, and the [other](#) highlights sustainability efforts at a newly built hospital in the Mayo system. The medical school does not organize community-facing events regarding 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:

Students do not receive regular communications about planetary health or sustainability. Although they are included in email invitations to Sustainability Grand Rounds (discussed in question 4), these rounds are not specifically targeted at medical students. Additionally, they are able to join internal broadcast channels on sustainability from the Green Committee or Mayo communications, but the general student population does not receive notifications from these groups.

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:

As of April 2021, Mayo began hosting Sustainability Grand Rounds every other month. Some of the previous topics include “The Environmental Impacts of Anesthesia,” “Wildfires, Heat, and Malaria: The Old and the New,” “Cancer Cost of Climate Change,” and “Climate Change, Health and Health Care: How Health Professionals can Help,”

In 2022, Mayo also hosted a “Seminar for Nurse Anesthetists” for continuing education credits that included a lecture called “Code Blue, Location Earth: Climate Change, Health Impacts and how Anesthesia Professionals Can Make a Difference.”

3.5. Does your <u>medical school</u> or its <u>affiliated teaching hospitals</u> 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 centers have accessible educational materials for patients.
<p><i>Score explanation: Mayo has created disease-specific handouts that mention the effects of environmental exposures. One patient education handout entitled "Seven Strategies for Cancer Prevention" includes limiting exposure to second-hand smoke and pesticides on produce. Another handout entitled "Healthy Nutrition and Cancer" mentions organic foods but states they have not been definitively associated with lower cancer risk. "Instructions for Men to Maximize Sperm Quality for Fertilization" recommends avoiding environmental exposures such as herbicides and pesticides. These handouts are available online for use at all Mayo campuses.</i></p>	

3.6. Does your <u>medical school</u> or its <u>affiliated teaching hospitals</u> 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.
<p><i>Score explanation: There is no single comprehensive article on the link between planetary and human health as a whole. However, there is a podcast Q&A about the effects of climate change on global childhood health and a news article about climate change and tick-borne infections. These are both online resources available to patients at all campuses.</i></p>	

Section Total (10 out of 14)	71.43%
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Support for Student-Led Planetary Health Initiatives

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

4.1. Does your medical school or your institution 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:</i> MCASOM certainly encourages sustainability related projects, and there are grants available at an institutional level for QI projects. However, none of these grants are specifically targeted towards sustainability, and there are no sustainability-related QI projects mandated as part of the curriculum.</p>	

4.2. Does your institution 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.
<p><i>Score explanation:</i> Although students are able to participate in research related to climate change and planetary health with faculty advisors, there are no specific programs or fellowships available for these projects.</p>	

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.	
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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:

Mayo Clinic as an institution has an accessible [green webpage](#) that highlights events and actions related to sustainability, however, the medical school does not have its own webpage. It is also difficult to use Mayo Clinic external or internal webpages to identify mentors involved with sustainable healthcare initiatives.

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 Mayo Medical Students for Sustainability is a student group expanded to the Rochester Campus in 2021 which receives faculty support and allows students to engage with sustainability initiatives at Mayo and in the community. There is also a Lifestyle Medicine group with similar aims that approaches sustainability from a lifestyle perspective.

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.

Score explanation: The Mayo Clinic has a student advocate on the institutional Green Committee. However, further work could be done to develop a Sustainability TA position for students to review school curricular materials and policies for planetary health principles.

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> <p>2) Mayo Clinic hosts sustainability grand rounds for trainees and employees of the clinic to become more aware of sustainability efforts and issues around Mayo. Students are a welcome part of this audience.</p> <p>5) The Mayo Clinic allows students to participate in a camping trip via the Wilderness Medicine Selective.</p>	

Section Total (7 out of 15)	46.67%
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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: There is currently one salaried sustainability staff member overseeing efforts in healthcare sustainability enterprise-wide. No person specifically represents the medical school in sustainability</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 Mayo Clinic has invested in greenhouse gas reduction, however they currently have no official plan for carbon neutrality. In 2011, Mayo Clinic pledged to reduce emissions by 20% through the Better Climate challenge, run through the U.S. Department of Energy. They met this goal several years early. They subsequently pledged to reduce Greenhouse Gas Emissions by 50% by 2032.</i></p>	

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:

Mayo clinic Rochester utilizes less than 1% renewable energy, attributable to one parking ramp equipped with 462 solar panels on the downtown campus. However, this parking ramp has plans for demolition in future years to make room for additional Destination Medical Center Investments. Sustainable construction and building plans have not been released for this project yet. Most sustainability initiatives focus around energy efficiency rather than utilizing renewable energy. Mayo Clinic was the recipient of a [2022 Practice Greenhealth environmental excellence award](#), (Emerald Award and Greening the OR award) for these efforts.

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:

All older buildings in the Rochester campus have been retrocommissioned. According to a [Mayo Clinic News Network publication](#), these changes have included “projects like:

- *Installing energy-efficient LED lighting in buildings and staff ramps*
- *Updating to more efficient computer workstations*
- *Recalibrating building automation systems that control a building's energy needs*
- *Resealing ducts”*

The Mayo Clinic also participates in the Better Buildings Alliance through the Department of Energy, and new buildings must comply with institutional sustainability guidelines modeled of LEED, however they are not LEED certified.

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:

[Students](#) have access to a free intercampus shuttle and are eligible for free Rochester Public Transport bus passes. There are bike racks and protected bike rooms on both Rochester campuses, and the Mayo Clinic is recognized as a bronze level bicycle friendly business by the [League of American Bicyclists](#). Active transportation modes are also emphasized during orientation, with a lecture and bike event. However, bicycle commuting is limited by poor bicycle infrastructure between campuses and in other parts of the city. There are safety concerns with this option, as three students were hit by cars during their active commute in 2022 and bikes have been stolen. Additionally, it can be extremely difficult to access off-campus clinical locations without a car.

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:

Information on waste management is included on a community engagement page that dives deeper into [environmental stewardship](#). Food waste on an institutional level is composted or repurposed into animal feed. There is no composting program within the medical school and no organic waste containers in any of the medical school buildings. Recycling is available in all medical school buildings.

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:

The medical school does not apply any sustainability criteria around food or beverage selection and follows institutional guidelines on procurement. Institutional food service sustainability goals exist however, including the discontinuation of styrofoam and increased selection of plant-based options and local foods (Revol greens from Owatonna)

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:

There are [institutional sustainability guidelines](#) for supply procurement, and the Mayo Clinic became a founding member of Greenhealth Exchange (a marketplace for sustainable purchasing) in 2017. However, the medical school is not engaged in efforts to increase procurement sustainability. Only items purchased through Mayo Clinic institutional channels are required to comply with Mayo Clinic guidelines.

5.9. 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.

Score explanation:

The medical school has no recommendations, incentives, or rules around sustainability of events.

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:</i> There are institutional initiatives to make the lab spaces more sustainable, but no guidelines, programs, or initiatives from the medical school.</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.
<p><i>Score explanation:</i> Mayo Clinic has several investments in fossil-fuel in Oklahoma and Texas. Oil and gas interests were originally donated to the Mayo Clinic in the 1990s and have since been expanded under the company Latigo. Cumulatively, Mayo Clinic has made \$190 million in royalty income from these donated oil fields. There have been efforts to increase investments in ESGs, but no current initiative to divest from fossil-fuels.</p>	

Section Total (8 out of 32)	25.00%
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Grading

Section Overview

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

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

Planetary Health Grades for the Mayo Clinic Alix School of Medicine - MN

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

Section	Raw Score %	Letter Grade
Planetary Health Curriculum (30%)	$(37/72) \times 100 = 51.39\%$	C
Interdisciplinary Research (17.5%)	$(10/17) \times 100 = 58.82\%$	C+
Community Outreach and Advocacy (17.5%)	$(10/14) \times 100 = 71.43\%$	B
Support for Student-led Planetary Health Initiatives (17.5%)	$(7/15) \times 100 = 46.67\%$	C
Campus Sustainability (17.5%)	$(8/32) \times 100 = 25\%$	D
Institutional Grade	50.75%	C

Report Card Trends

Section Overview

This graph demonstrates trends in overall and section grades for the years in which Mayo Clinic Alix School of Medicine - MN has participated in the Planetary Health Report Card initiative.

Planetary Health Report Card Trends for Mayo Clinic Alix School of Medicine - MN

