



Planetary Health Report Card:

Emory University School of Medicine



EMORY
UNIVERSITY
SCHOOL OF
MEDICINE

2021-2022 Contributing Team:

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Summary of Findings

Overall	A
<u>Curriculum</u>	A-
<p>Emory University School of Medicine is in its second year of implementing a climate change & health curriculum for pre-clinical students, with learning points across lectures and small group sessions. The climate curriculum team has built on the first cohort’s success to address gaps in climate & health learning. Emory approved another proposal in January 2022 that formalizes the effort to extend climate learning through all four years of medical school.</p> <p>Recommendations: Curriculum development will continue with an emphasis on co-creation and content integration. Future opportunities include the standardized patient curriculum, didactic teaching in the M3 clerkship year, and courses highlighting sustainable healthcare delivery.</p>	
<u>Interdisciplinary Research</u>	A+
<p>Interdisciplinary collaboration across graduate and undergraduate programs is central to Emory University’s vision. Climate health and sustainability funding can be found through the Woodruff Health Sciences Center, notably the Synergy Research Award. HERCULES and the Urban Health Initiative both leverage local community participation to direct community-guided research.</p> <p>Recommendations: The School of Medicine could more visibly promote existing clinical sustainability efforts and also encourage participation of medical school faculty and students in interprofessional sustainability initiatives.</p>	
<u>Community Outreach and Advocacy</u>	A
<p>The new CME course, "Climate Crisis and Clinical Medicine" and the SOM Climate & Health Curriculum have bolstered climate education and awareness within the medical community. Emory maintains a “Climate Talks” series and introduced a podcast, “AmpliFIRE: Raising Voices Against Rising Temperatures.” The Hercules Exposome Research Center and the Pediatric Environmental Health Specialty Unit also contain online community resources.</p> <p>Recommendations: Students and faculty should work to improve the distribution of educational materials pertaining to environmental exposures, associated health impacts and climate change across all affiliated hospitals and clinics.</p>	
<u>Support for Student-Led Initiatives</u>	A+
<p>Emory University’s Office of Sustainability Initiatives (OSI) offers sustainability and social justice grants to students annually. Students are also supported in volunteer community engagement programs across Atlanta.</p> <p>Recommendations: We advise Emory to dedicate funding to student-led, hospital-based sustainability initiatives, starting by matching OSI initiatives. In addition, we recommend our research website designate a specific tab to mentors involved in PH related research.</p>	
<u>Campus Sustainability</u>	B+
<p>Emory University has cultivated widespread acceptance of sustainability on campus, including at the medical school. Emory ranked #6 for top green colleges in 2022 according to the Princeton Review, and is aiming for 50% energy reduction per square foot for Emory College and 25% for Emory Healthcare by 2025.</p> <p>Recommendations: Emory’s greatest challenge resides in clean energy sourcing. Emory plans to self-generate 10% of its energy by 2025 and we recommend that Emory enlists the support of major backers such as Emory Healthcare for investment in these initiatives to reduce and diversify energy usage.</p>	

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.
- **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 (for example, undergraduate departments (USA), other related departments eg 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 example).

Added to our resources this year, 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. Did your medical school offer elective courses (student selected modules) to engage students in Education for Sustainable Healthcare or Planetary Health in the last year?	
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.

Score explanation: An elective on planetary health was offered to M2s. The Climate Crisis and Clinical Medicine Elective remains an offering for M4s and is online for use by students and faculty at Emory and elsewhere. Several electives related to planetary health and climate change are also offered through Rollins School of Public Health. Perhaps due to increased coverage of content in core lectures and availability of extracurricular activities, electives have had low enrollment this year. Due to low enrollment in the M2 elective, interested students participated in a tailored “dedicated study” elective.

Curriculum: Health Effects of Climate Change

2. Does your medical school 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.

Score explanation: Except as otherwise noted, all topics referenced below are addressed in Emory's disseminated climate change & health curriculum for pre-clinical students, with content co-produced by Dr. Becca Philipsborn, students Katie Steklac (M1), Isabella Amaniera (M1), Madhu Manivannan (M2), Irene Liu (M2), Emaline Laney (M4) and Ben Rabin (M3/MPH), and Emory faculty lecturers or course directors.

These topics were addressed in the following in-depth lectures/ activities:

- *Current lecture: "Heat and Its Effect on Migrant Workers" with Dr. Roxana Chicas is embedded in the Nephrology Course directed by Dr. Jim Bailey. Dr. Chicas discusses the impact of extreme heat on agricultural workers, with LOs:*
 - *LO: Describe how heat affects human health*
 - *LO: Discuss the field-based monitoring research methods and results found related to heat stress and renal function*
 - *LO: Discuss factors potentially influencing the renal health and heat response of agricultural workers*
 - *Current lecture: Exercise Physiology by Dr. Jonathan Kim discusses heat-related illness, differentiates heat exhaustion and heat stroke, and discusses the need for prompt recognition. Discussion of heat illness in athletes is given context with Atlanta's Peachtree Road Race.*
 - *Current Lecture: Environmental determinants of health across the lifespan: A climate lens with Dr. Saria Hassan is integrated into Human Development, with support from Co-directors Drs. Terri McFadden and Ricky Gillespie. Dr. Hassan presents a case of heatstroke in outdoor worker with comorbidities, and also heat-related heart failure exacerbation.*
 - *LO: Review intersectionality of environmental exposure, climate change and health*
 - *LO: Apply the environment vulnerability framework to identify who (across the lifespan) is at greater risk of environmental exposure*
 - *LO: Understand how social and structural determinants of health mediate vulnerability to environmental exposures*
 - *LO: Assess environmental risk factors in clinical encounters*
 - *Current Lecture: Dr. Richard Johnson's guest lecture pertaining to heat-related nephropathy*
- In addition, these topics were integrated in the following lectures:*
- *Current Lecture: "Exercise and the Healthy Human I" with Dr. Laurence Sperling*
 - *LO: Identify the role of exercise in prevention and health*
 - *Current Lecture: "Epidemiology and Pathophysiology" of Cerebrovascular Disease with Dr. Aaron Anderson is integrated into the Neurology Course directed by Dr. Dan Winkel. Dr. Anderson discusses temperature extremes as risk factors for acute cerebrovascular accidents with emphasis on health disparities and neighborhood level risk factors.*

- *Current Lecture: “Introduction to Climate Change and Health” with Dr. Rebecca Philipsborn integrated into Emory’s “Prologue 1,” course directed by Dr. Mary Jo Lechowicz.*
 - *LO: Identify populations with relatively greater risk of exposure to climate change.*
 - *LO: Outline an example pathway through which climate change impacts health.*

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: Addressed in disseminated climate change & health curriculum for pre-clinical students (as described above).

Current lecture – Climate and Environmental Health Introduction with Dr. Rebecca Philipsborn. Reviews a case of hospital evacuation, disrupted supply chains, and patients displaced by extreme weather. LOs as noted above, and:

- *LO: Identify 3 ways that climate change disrupts healthcare delivery.*

Current lecture - “End stage Congenital Heart Failure and Cardiac Transplant” with Dr. Kunal Bhatt

- *Climate Content embedded within LO: Understand the role of Left Ventricular Assist Device therapy in advanced heart failure. Examined how natural disasters disrupt healthcare delivery, and proposed methods to support patients reliant on medical devices such as LVAD and HD in extreme weather scenarios.*

Current Lecture: Environmental determinants of health across the lifespan: A climate lens with Dr. Saria Hassan. Described health impacts of heatwaves in the context of LOs as noted above.

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: Addressed in pre-clinical students climate & health curriculum at several different points.

- *Current Lecture: “Pneumonia” with Dr. Varun Phadke*
 - *Climate Content Embedded within LO: Describe the clinical features of pneumonia and identify elements of a patient’s syndrome that provide clues to the microbial etiology.*
 - *Discuss the relationship between environmental factors, pathogen and host. Discuss the effect of extreme heat, air pollution and extreme weather on pneumonia incidence.*
- *Current Lecture: “Malaria” with Dr. Jennifer Spicer*
 - *Discussion of climate change impact on malaria distribution discussed in LO: Identify the most likely Plasmodium species causing an infection based on epidemiology*
- *Current Lecture: “Tick-borne Illness” with Dr. Jeffrey Lenox*
 - *Embedded in LO: Describe how the distributions of tick-borne diseases do or do not overlap. Discussion of Lyme disease range, predictions for expanded distribution with climate change.*
- *Current Activity: Case included on climate and health as a “headline” topic in Dr. Wendy Armstrong’s summation symposium.*
- *Current Lecture: Current lecture – Climate and Environmental Health Introduction with Dr. Rebecca Philipsborn. LOs as noted above, and:*
 - *LO: Define “planetary health” and state in your own words why climate change matters for medicine*

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: Addressed in pre-clinical students climate & health curriculum, particularly in the Pulmonology Course directed by Dr. Ashish Mehta.

- *Current Small Group – “Pulmonary Function Test Interpretations”*
 - *LO: Analyze socioeconomic and racial disparities in lung health related to zoning, transportation, and other policies that result in disproportionate air pollution levels in communities of color.*
- *Current Lecture: “COPD” Dr. Ashish Mehta*
 - *LO: List sources of particulate matter pollution and differentiate between coarse (PM10) and fine (PM2.5) particulate matter.*
- *Current Lecture: “Asthma” with Dr. Rebecca Kapolka (2021) and Dr. Martin Runnstrom (2022)*
 - *LO: Illustrate how particulate matter air pollution affects respiratory health in children and adults.*
- *Current Lecture: “Common Pediatric Respiratory Disorders” with Dr. Lokesh Guglani*
 - *LO: Describe how environmental pollution compromises pulmonary function and lung development.*
- *Current Lecture: Climate and Environmental Health Introduction with Dr. Rebecca Philipsborn reviews a case of a child with asthma triggered by environmental exposures, with LOs as noted above.*
- *Current Lecture: Pulmonary Pharmacology with Dr. TJ Murphy covers inhaled size of particulate matter particles/wildfires, soot, and climate change*
- *Current Lecture: Environmental determinants of health across the lifespan: A climate lens with Dr. Saria Hassan. Described example of asthma exacerbation provoked by air pollution with LOs as noted above.*

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: Addressed in pre-clinical students climate & health curriculum.

- *Current Lecture: “Exercise and the Healthy Human” with Dr. Laurence Sperling*
 - *Discussed the effect of air pollution and wildfires on risk of cardiovascular disease and stroke. Also defined urban heat islands and impact of zip code on health.*
- *Current lecture: “Pathology of Atherosclerosis and Ischemic Heart Disease” with Dr. Douglas Parker*
 - *Climate content embedded within LO: “List the major risk factors in the development of atherosclerosis.” Described how air pollution exposure contributes to vascular remodeling and atherosclerosis through oxidative stress and inflammation. Related environmental stressors to the burden of CV disease.*
- *Current lecture: “Introduction to Congenital Heart Disease” with Dr. Matthew Carazo*
 - *Climate content embedded within LO: “State the frequency of congenital heart disease.” Outlined risk of maternal ambient heat exposure for fetal development.*
- *Current lecture: “End stage Congenital Heart Failure and Cardiac Transplant” with Dr. Kunal Bhatt. LOs as noted above, expanded upon with Dr. Bhatt’s example of LVAD patients unable to charge their device due to power outage following Hurricane Maria.*

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: Addressed in pre-clinical students climate & health curriculum.

- *Elective Lecture: “The Global Climate Emergency: Psychological Aspects” with Dr. Lise van Sustern discussed the impacts of climate change on cognition, cognitive performance, and mental health.*
- *Current lecture: “Climate and Environmental Health Introduction” with Dr. Rebecca Philipsborn discussed context of climate-health exposure pathways and displacement as a risk factor for mental health sequelae*
- *Current Lecture: Environmental determinants of health across the lifespan: A climate lens with Dr. Saria Hassan discussed dementia in the context of environmental determinants of health as one ages*

Apart from our core curriculum, mental health and neuropsychological effects are also discussed in Emory’s directed study elective trip to the Carlos Each/Other exhibit. While we have disseminated content on this metric, we recognize the scope and importance of this topic and do not feel that we cover it sufficiently at this time. Emory has plans for integration with the subsequent cohort in partnership with Dr. Wendy Baer, including exploration of anxiety disorders and PTSD following climate disasters; green burial techniques; introduction and definition of ‘climate grief.’

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: Addressed in pre-clinical students climate & health curriculum.

- *Current Lecture: “Nutritional Deficiencies” with Dr. Meena Prasad discussed the impact of climate change on food insecurity and nutrition.*
- *Upcoming Lecture: “The Global Syndemic of Climate Change, Malnutrition and Obesity” by Dr. Sobenna George is embedded within the Endocrinology Course with support from Dr. Eric Felner.*
- *Current Lecture: Dr. Cassandra Quave, an expert in ethnobotany, gives a lecture that existed prior to the climate and environmental health curriculum and supplements its content. She discusses the use and development of botanical treatments, traditional medicines, and how climate change, habitat loss, and overharvesting threaten access to medicinal plants for health.*
- *Small Groups: In Endocrinology small groups on short stature and diabetes with Dr. Eric Felner, student learning points include climate change and global undernutrition and topics that link individual patient health with global systems.*

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: Addressed in pre-clinical students climate & health curriculum across several lectures and small groups, as well as in elective content.

- *Current lecture: “Climate and Environmental Health Introduction” with Dr. Rebecca Philipsborn introduces climate change as social justice issue and health equity multiplier, introduces intersection of environmental exposures related to redlining and structural discrimination, and introduce the exposure-vulnerability-adaptive capacity framework for approaching risk.*
- *Current Lecture: “Epidemiology and Pathophysiology” of Cerebrovascular Disease with Dr. Aaron Anderson – included in depth discussion of neighborhood as risk factor within learning point on temperature extremes and risk for acute cerebrovascular accident.*
- *Current Lecture: “Maternal Adaptations of Pregnancy” with Dr. Mary Dolan – included discussion of disparities around the effects of climate change on maternal-fetal development and health outcomes.*
- *Current Lecture: Environmental determinants of health across the lifespan: A climate lens with Dr. Saria Hassan builds upon the environmental vulnerability framework, integrates health disparities in conceptual framework of exposure risk, and emphasizes climate change as a social determinant throughout every component of the lecture, with LOs as noted above.*
- *Current Small Group – “Case-Based Learning: Lung Disease.” Pulmonary Function Test interpretation includes a case of a child, and discusses the effect of pollution on asthma and PFTs in children in the context of the LO: “Analyze socioeconomic and racial disparities in lung health related to zoning, transportation, and other policies that result in disproportionate air pollution levels in communities of color.”*

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: Addressed in pre-clinical students climate & health curriculum.

In particular, Dr. Philipsborn addresses the unequal health impacts of climate change in her introductory lecture by presenting climate change as a human rights issue and social and intergenerational justice concern. This topic is also addressed in the global child mortality lecture in global health elective coursework for M2s.

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.
<p><i>Score explanation: Addressed in pre-clinical students climate & health curriculum.</i></p> <ul style="list-style-type: none"> ● <i>Current Lecture: “Maternal Adaptations of Pregnancy” with Dr. Mary Dolan</i> <ul style="list-style-type: none"> ○ <i>LO: “Discuss the effects of climate change on maternal-fetal development and health outcomes.” Outlined the racial disparities in exposure to heat and air pollution among pregnant women. Mentioned how this contributes to disparities in perinatal outcomes.</i> <p><i>Dr. Saria Hassan discusses birth complications related to heat exposure and social factors that increase patient vulnerability in her aforementioned lecture (LOs are as noted above).</i></p> <p><i>Dr. Rebecca Philipsborn also discusses the impact of climate change on pregnancy outcomes in her aforementioned introductory lecture.</i></p>	

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.
<p><i>Score explanation: Addressed in pre-clinical students climate & health curriculum.</i></p> <p><i>In particular, Dr. Philipsborn’s introduction lecture begins the “discussion of lengthening pollen season, hurricanes in south GA, air pollution in Atlanta, food insecurity” and continues the discussion throughout the curriculum. Dr. Mary Dolan’s lecture on “Maternal Adaptations of Pregnancy” addressed the disparate exposures to heat and air pollution with regard to perinatal outcomes. Dr. Kunal Bhatt’s lecture “End stage CHF, LVAD, and cardiac transplant” discusses an example of LVAD patients unable to charge their device due to power outage following natural disasters such as hurricanes. Dr. Hassan discussion of how heat & air pollution affect vulnerable patients.</i></p> <p><i>Further, redlining and its impacts on local communities within and surrounding Atlanta are discussed in several lectures in the core curriculum. This topic is included within Dr. Philipsborn’s “Introduction to Climate Change & Health” lecture, Dr. Anderson’s “Epidemiology and Pathophysiology” of Cerebrovascular Disease lecture, and on multiple occasions in the pulmonology and neurology modules.</i></p>	

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: Indigenous knowledge and value systems are currently emphasized as essential components of planetary health solutions primarily in elective coursework. In particular, this past year, Emory students on elective visited the [Carlos Museum Each/Other exhibit](#) and the [Mirror Shield Project](#). Emory currently offers more in depth content pertaining to this topic for pediatrics residents, and there is desire to incorporate more into the medical student curriculum in the coming years.

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: Emory covers this topic via discussion of air pollution and chemical mobilization in extreme weather events in our "Pulmonary Function Test Interpretations" small group. In this discussion, small groups analyze socioeconomic and racial disparities in lung health related to zoning, transportation, and other policies that result in disproportionate air pollution levels in communities of color.

This topic is further discussed in the context of redlining by Dr. Philipsborn in her "Climate and Environmental Health Introduction lecture" and by Dr. Hassan in her "Environmental determinants of health across the lifespan: A climate lens." Other notable points of inclusion for this topic at Emory include lectures within Emory's Community Learning and Social Medicine core requirement as well as in the Pulmonology course.

Curriculum: Sustainability

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: Addressed in pre-clinical students climate & health curriculum.</i></p> <p><i>In particular, a discussion of plant-based diet co-benefits is integrated into teaching on preventive cardiology, lecture by Dr. Laurence Sperling and reinforced in Dr. Sperling's Atherosclerosis lecture in the context of the Million Hearts 2027 Initiative. The environmental and health co-benefits of a plant-based diet are addressed in Dr. Philipsborn's introductory lecture on climate. This topic is also covered in small groups on Acute Coronary Syndrome, where it is offered by Dr. Dimitri Cassimatis (Cardiology Course Director) as a student discussion topic for the session.</i></p>	

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.
<p><i>Score explanation: Addressed in pre-clinical students climate & health curriculum.</i></p> <p><i>Current Lecture: "Introduction to Climate Change & Health" with Dr. Rebecca Philipsborn covers the approximate percent contribution of the US Healthcare sector to US greenhouse gas emissions. There are further plans to integrate more of this topic into the curriculum given that the Climate Change & Health curriculum was accepted as a "thread" by the Emory School of Medicine curriculum committee, meaning that it will be integrated throughout all components of the medical education curriculum, from pre-clinical throughout clinical years.</i></p>	

17. Does your medical school curriculum cover these components of sustainable clinical practice in the <u>core</u> curriculum? (1 point each)	
1	Waste production within the healthcare system and strategies for reducing waste in clinical activities, such as in the operating room
1	The impact of inhalers on the healthcare carbon footprint and the environmental benefit of dry powdered inhalers over metered dose inhalers.
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 anaesthetic gas options with reduced greenhouse gas emissions
1	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 for obesity. This is commonly known as social prescribing in the UK.
1	The health and environmental co-benefits of avoiding over-medicalisation, over-investigation and/or over-treatment
<p><i>Score explanation: Dr. Philipsborn states need to assess and address environmental exposure history in children with asthma in addition to prescribing medical therapy and benefits of active transport. Dr. Laurence Sperling discusses health benefits of active transportation within the field of preventive cardiology. Slides and discussion on health care waste will be integrated into a lecture on Endoscopy by Dr. Tanvi Dhere, GI Course Director, for the current cohort of students.</i></p>	

Curriculum: Clinical Applications

18. In training for patient encounters, does your medical school’s curriculum introduce strategies to have conversations with patients about the health effects of climate change?	
2	Yes, there are strategies introduced for having conversations with patients about climate change in the core curriculum.

1	Yes, there are strategies introduced for having conversations with patients about climate change in elective coursework.
0	No, there are not strategies introduced for having conversations with patients about climate change

Score explanation: In the Rheumatology module directed by Dr. Jennifer Brandt, students are taught how to offer anticipatory guidance to patients with gout, SLE and dermatomyositis related to climate change. For example, counseling patients with gout to prioritize hydration during hot days; counseling patients with photosensitivity related to SLE and DM to avoid prolonged sun exposure. In the Pulmonology module small group, students are taught how to provide anticipatory guidance along with taking respiratory exposure histories (see below).

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: In the pulmonary module, students learn how to evaluate patient risk related to air pollution or other respiratory exposures with Dr. Ashish Mehta, and this content is covered in Dr. Saria Hassan’s lecture in Human Development (as noted above). Students also receive talking points for how to counsel patients about potential health harms in Pulmonology. This information is delivered during small group sessions to allow for discussion and active engagement.

Curriculum: Administrative Support for Planetary Health

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.
<p><i>Score explanation: As of January 2022, the Climate Change & Environmental Health Curriculum was officially designated as a “thread” by Emory’s Executive Curriculum Committee, a follow-up to their vote for this effort to move forward in late 2019. This vote means supports further integration of this content throughout the curriculum from pre-clinical throughout clinical years.</i></p>	

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: The pre-clinical Climate Change & Environmental Health curriculum, first introduced for the class of 2024, spans most organ-systems across the first 18 months of medical school. The climate & health curriculum team (including students under the direction of Dr. Rebecca Philipsborn) engaged faculty members (including lecturers and course directors), and incorporated climate learning points into existing lectures as well as 3 new dedicated climate lectures. The curriculum also adds environmental health discussion points to small group activities, and we plan for more engagement in this space with the next cohort of students.</i></p>	

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.
<p><i>Score explanation: Dr. Rebecca Philipsborn is the lead faculty member for the Climate Change & Health curriculum at Emory School of Medicine. In this role, Dr. Philipsborn coordinates climate learning points with participating faculty members and students, co-creates original content with students, and gives the introductory lecture on Climate & Health to first-year medical students.</i></p>	

Section Total (58 out of 69)	84.0%
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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.

So many at Emory have supported this effort with time, dedication, and creativity. We would like to give special thanks to Emory's Office of Sustainability Initiatives for supporting our students and curricular efforts. In addition to those listed lecturers and course directors noted elsewhere, we would like to thank faculty whose support has been invaluable as we sought to formalize our curriculum this year as a "thread," including Drs. Gordon Churchward, Hughes Evans, Mark Mullins, Megan Henn, Linda Lewin, Don Batsky, Maura George, Ira Schwartz, Bill Eley, David Schulman, Erica Brownfield, and Dean Sukhatme, as well as all of the students and faculty who supported us during curriculum committee reviews.

Interdisciplinary Research

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

1.Are there researchers engaged in planetary health research and healthcare sustainability research at your medical school?	
3	Yes, there are faculty members at the School of Medicine who have a primary research focus in planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the School of Medicine who are conducting research related to planetary health or healthcare sustainability, but it is not their primary research focus.
1	There are planetary health and/or healthcare sustainability researchers at the institution, but none associated with the medical school.
0	No, there are no planetary health and/or healthcare sustainability researchers at the institution or medical school at this time.

Score explanation: Many faculty are engaged in climate change and/or Planetary Health work. Some include:

[Dr. Jessica Fairley, MD, MPH](#) – Topics: Planetary Health and Neglected Tropical Diseases. Dr. Fairley was a founding member of a Planetary Health and Infectious Diseases working group. Sample publications:

- [Climate Change and Influenza: A Scoping Review](#)

[Dr. Rebecca Philipsborn, MD, MPA](#) -- Topics: Climate Change & Health Education, Migration, Global Child Health; Sample publication:

- [Climate Change and the Practice of Medicine: Essentials for Resident Education](#)

[Dr. Saria Hassan, MD](#) – Topics: Climate change and non-communicable diseases, disaster preparedness; Dr. Hassan’s work addresses the needs of people living with chronic disease after natural disasters. Sample publication:

- [Management Of Chronic Noncommunicable Diseases After Natural Disasters In The Caribbean: A Scoping Review](#)

[Dr. Jane Duggan, MD](#) -- Topics: Sustainability in Healthcare

- Leads Emory’s OR Green Team at Emory University Hospital Midtown
- Member of Emory Healthcare’s Sustainability Committee

[Dr. Demetrius Leon Woods, MD, MPH](#) -- Topics: Sustainability in Healthcare

Recent publications:

- [Carbon footprint of robotically-assisted laparoscopy, laparoscopy and laparotomy: a comparison](#)
- [Comparison of the environmental impact of commonly used surgical approaches to hysterectomy](#)

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 Emory Climate and Health Research Incubator](#) is an initiative of [Climate@Emory](#), a university-wide effort at [Emory University](#) to advance climate change scholarship, teaching, partnership, and engagement at Emory and beyond.

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:

Emory provides various avenues through which communities that are disproportionately impacted by climate change within and around Atlanta can provide input and become decision-makers pertaining to the direction of our medical school's research agenda. [HERCULES](#), Emory's [Urban Health Initiative](#), [The Pediatric Environmental Health Specialty Unit \(PEHSU\)](#), and [The Resilience and Sustainability](#)

[Collaboratory](#) all serve to prioritize the voices of communities on research questions and outreach that in turn feeds back into research efforts at Emory's schools of nursing, public health, and medicine.

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:
Emory has a website devoted to the environment and sustainability on campus and within the Atlanta community: [Emory Sustainability](#). The [Climate@Emory](#) website also meets these criteria - see metric #2 above.*

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:
Emory University Woodruff Health Sciences Center, which has multiple components including the School of Medicine, helped host the Virtual Climate Crisis and Clinical Practice Symposium in April,*

2021. In addition to this symposium, Emory has hosted an exceedingly large number of [Climate Talks](#) over the past year.

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:

Emory University School of Medicine is a member of both the Planetary Health Alliance (via Emory University as a whole) and Global Consortium on Climate and Health Education.

Section Total (17 out of 17)

100%

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

Community Outreach and Advocacy

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

1. Does your medical school partner with community organizations to promote planetary and environmental health?	
3	Yes, the medical school meaningfully partners with multiple community organizations to promote planetary and environmental health.
2	Yes, the medical school meaningfully partners with one community organization to promote planetary and environmental health.
1	The institution partners with community organizations, but the medical school is not part of that partnership.
0	No, there is no such meaningful community partnership.
<p><i>Score explanation: Yes, our student-led interest group and curriculum advisors have partnered with Emory's core Longitudinal Community Learning and Social Medicine core class to add numerous community sites addressing Environmental Justice including but not limited to relationships with Emory Farmworker Project and Emory's Urban Health Initiative. Olivia Cote and William Harousseau co-Chair MSCA's Environmental Justice and Advocacy Committee and help coordinate community-engaged activities and events with the rest of the MSCA team.</i></p>	

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

Score explanation: Emory hosts [Climate Talks](#), an ongoing webinar series that is community-facing in that it is open to the public and recordings are available on YouTube. During 2021, there were about 2-3 talks each month. In addition to Climate Talks, there are three seasons of the Emory hosted podcast, “AmpliFIRE: Raising Voices Against Rising Temperatures”, available on SoundCloud.

Schedule for future webinars: <https://climatetalks.emory.edu/dialogues/webinars>

3. Does your medical school have regular coverage of issues related to planetary health and/or sustainable healthcare in university update communications?

2	Yes, all students regularly receive communication updates dedicated to planetary health and/or sustainable healthcare.
1	Yes, planetary health and/or sustainable healthcare topics are sometimes included in communication updates.
0	Students do not regularly receive communications about planetary health or sustainable healthcare.

Score explanation: Yes, we have weekly email updates regarding coverage of issues related to sustainability and planetary health from our Office of Sustainability Initiatives. Moreover, these topics are covered in Emory’s on-campus magazine, “[Emory Magazine](#)”.

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 the 2020-2021 academic year, Emory offered a CME symposium addressing climate change, “Climate Crisis and Clinical Medicine,” directed by Dr. Rebecca Philipsborn, MD, MPA. Examples of covered topics include emerging clinical challenges as a result of climate change, health equity and social justice, communication strategies, and climate solutions for healthcare. Grand Rounds CME events on climate change were offered in the Departments of Radiology, Internal Medicine, and Pediatrics on Climate Change and Health. There was also a MedTalk session dedicated to educating faculty to teach about climate and health by Dr. Mehul Tejani and Dr. Philipsborn.

5. Does your medical school or its primary affiliated hospital have accessible educational materials for patients about environmental health exposures?

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

Score explanation: Several Emory School of Medicine Faculty Members are members of the Hercules Exposome Research Center which has curated a number of resource guides on different environmental health topics for patients in the Atlanta community. These resources can be found [here](#). Additionally, Emory/Grady Memorial Hospital runs the Georgia Occupational and Toxicology Clinic which has physicians that work with patients to diagnose and treat a variety of occupational and environmental diseases, poisonings, and exposures to hazardous substances. [Education materials](#) from the Southeast Pediatrics Environmental Health Specialty Unit are also used in Emory's Pediatric Departments.

6. Does your medical school or its primary affiliated hospital have accessible educational materials for patients about climate change and health impacts?

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

Score explanation: See information above from the PEHSU; and a [trifold pamphlet](#) was recently created using adapted materials from Georgia Clinicians for Climate Actions, supported by the Southeast Pediatric Environmental Health Specialty Unit, and distributed to school nurses in Georgia and to clinicians at Children's Healthcare of Atlanta. The Georgia Climate Project Information Portal also provides basic public-facing information on [Climate Change and Health](#).

Section Total (12 out of 14)	85.7%
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Are there additional community engagement and advocacy resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

Support for Student-Led Planetary Health Initiatives

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

1. Does your institution offer support for medical students interested in enacting a sustainability initiative/QI project?	
2	Yes, the institution <i>either</i> offers grants for students to enact sustainability initiatives/QI projects <i>or</i> sustainability QI projects are part of the core curriculum.
1	The medical school encourages sustainability QI projects (to fulfill clerkship or longitudinal requirements) and offers resources to help students succeed in these projects, but there is no student funding available and there is no requirement to participate.
0	No, the institution does not offer opportunities or support for sustainability initiatives or QI projects.

Score explanation: Student-Led sustainability initiatives are well-supported by Emory. The University offers a [General Sustainability and Social Justice Incentives Fund](#) through the Office of Sustainability. This fund allows all Emory and Emory Healthcare students, faculty and staff to request up to \$3,000 for any project or research related to sustainability at Emory and the intersections of sustainability and social justice via application every Fall. In November of 2021, Emory Medical Students for Climate Action successfully received funds to assist with medical student focus groups addressing the sustainability curriculum changes, and implement an at-home composting workshop for Emory School of Medicine students that will be hosted in the Spring of 2022.

In addition, [The Green Labs at Emory](#) & [Green Offices at Emory](#) offer all students, faculty and staff to apply for funding to implement new actions and innovations at their certified Green Lab or Office. The grant awards up to \$5,000 for proposals that promote sustainable management of supplies, waste, and more via application every Fall. In November 2021, Emory Medical Students for Climate Action applied to certify the School of Medicine Anatomy Lab and received recognition as a Bronze Level Green Lab.

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: The General Sustainability and Social Justice Incentives Fund offered by Emory's Sustainability Office, as noted in the first question of this section, will also fund planetary health and/or sustainable healthcare research initiatives. This funding is explicitly meant for research pertaining to planetary health and/or sustainable healthcare.</i></p> <p><i>Moreover, Emory medical students can obtain funding for planetary health and/or sustainable healthcare research through the Emory Primary Care Consortium Grants. These grants provide \$12,000 each fiscal year in grants of up to \$3,000 to support any Emory-affiliated project that involves research, quality improvement, advocacy, development of clinical decision support tools, or educational activities in support of advancements in primary care. In the the application criteria it is stated, "Project topics may center around patient safety, innovations in healthcare delivery, addressing disparities in healthcare, etc." Upon review, research pertaining to sustainability and planetary health would fall under healthcare disparities and/or patient safety. Moreover, it has been acknowledged that projects pertaining to public and environmental health have been conducted in the past. Any Emory student, resident, or faculty member (including VA faculty with an Emory appointment) may apply.</i></p> <p><i>In more rare cases, graduate students who opt to take environmental health courses at the undergraduate campus are eligible to apply for the Lester and Turner Grants.</i></p>	

3. Does the medical school have a webpage where medical students can find specific information related to planetary health and/or sustainable healthcare activities and mentors within the medical school? For example, projects achieved, current initiatives underway at the medical school and/or contact of information of potential mentors.	
2	The medical school has a webpage with specific information related to planetary health or sustainable healthcare that includes up-to-date information on relevant initiatives and contact information of potential mentors.
1	There is a medical school webpage that features some information on projects and mentors within planetary health and sustainable healthcare within the medical school, but it lacks key information.
0	There is no medical-school specific webpage for locating planetary health and/or sustainable healthcare projects or mentors.
<p><i>Score explanation: Yes, Emory has a website dedicated to planetary health and/or sustainable healthcare activities and mentors within the medical school and outside of the medical school. It can be found at this site: https://climate.emory.edu/bios/index.html Additional initiatives can be found here under the "Initiatives" tab.</i></p>	

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: Emory Medical Students for Climate Action (MSCA) is an established student group working towards climate solutions and environmental justice at Emory University School of Medicine. This group is supported by a faculty advisor (Dr. Philipsborn) and is an affiliate of Medical Students for a Sustainable Future. We can be reached via [Twitter](#) or via direct contact with Co-Presidents Gilda Rastegar (grasteg@emory.edu) or Madhu Manivannan (madhumitha.manivannan@emory.edu).

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: Emaline Laney and Ben Rabin are student liaisons who both sit on the Emory Healthcare Sustainability Council and help advise the medical school regarding sustainability practices.

6. In the past year, has the institution had one or more co-curricular planetary health programs or initiatives in the following categories? (1 point each)

1	Projects where students are able to gain experience in organic agriculture and sustainable food systems, such as gardens, farms, community supported agriculture (CSA), fishery programs, or urban agriculture projects.
1	Panels, speaker series, or similar events related to planetary health that have students as an intended audience.
1	Events in which students learn directly from members of a local environmental justice community about the climate and environmental challenges they face, and how health professionals can partner with their community to address these exposures and impacts.

1	Cultural arts events, installations or performances related to planetary health that have students as an intended audience.
1	Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts.
1	Wilderness or outdoors programs (e.g., that organize hiking, backpacking, kayaking, or other outings for students)

Score explanation:

- (1) There are many opportunities to gain experience in organic agriculture and sustainable food systems at Emory. The medical school has a [community garden](#) that helps cultivate food and community on Emory's campus. The [Educational Gardens](#) on campus are maintained by teams of Emory community members and are located all over campus.*
- (1) Emory holds numerous panels and speaker events related to planetary health.*
In December 2021, Emory pediatric physicians and residents held a Pediatrics & Climate Change Town Hall where a panel of pediatric climate health experts to discuss how the climate crisis impacts patients and how to support patients and communities.
- In November 2021, Emory Climate Talks students participated remotely in this year's COP26.*
- In September 2021, MSCA's advisor spoke during the Egleston Grand Rounds on "Climate Change and Clinical Practice: The Urgency and Opportunity of Now"*
- Emory has continued to host "Climate Talks," an ongoing webinar series.*
- Rollins School of Public Health hosts a speaker series from Gangarosa Department of Environmental Health.*
- (1) Emory Medical Students for Climate Action works to bring members of our local community to directly speak to students on how they can partner with the organization to address environmental and climate challenges. In the Fall of 2021, MSCA hosted Carol Denhof to speak on behalf of the Longleaf Alliance to discuss the local organization's restoration efforts and ways students can get involved.*
- (1) Both medical students on elective and pediatric residents had a class session at the Carlos Museum's Each/Other exhibit with Dr. Philipsborn, Emory MSCA's faculty advisor.*
- (1) Emory offers numerous opportunities to engage with developing community resilience to anthropogenic environmental impacts.*
- Emory Medical Students for Climate Action held two urban farming opportunities for medical students to volunteer at the Thomasville Elementary School farm in 2020.*
- MSCA encouraged students to get involved in the [Urban Heat ATL](#) project, collecting data on heat to map urban heat islands in Atlanta to inform how extreme heat disproportionately affects the most vulnerable communities in densely populated areas.*

After discovering high lead levels in the soil in certain regions in the Westside of Atlanta, Dr. Eri Saikawa received a grant from the EPA to investigate if children living on and playing in this region have high lead levels. A group of Emory affiliated interdisciplinary researchers, including medical students, are currently collecting this data.

Rollins Environmental Health Action Committee (REHAC) has a mission to encourage students to make environmentally friendly decisions in their daily lives and raise awareness about environmental justice issues in our community and around the world.

Slow Food Emory promotes conversations and appreciation for good, clean, and fair food through volunteer workdays, cooking demonstrations, and other community events with the goal of making sustainable food adaptable and accessible for Emory students.

Emory's Student Sustainability Forum is a group of student leaders from sustainability-related organizations, student publications, and student governmental associations who collaborate and learn about broader campus and community sustainability initiatives.

(1) The Wilderness Medical Society at Emory holds an annual trip to Bryson City, NC in September and offers medical students the opportunity to go whitewater kayaking or hiking. The trip includes a two night stay at a cabin, and students with any experience background are welcome to join the trip. There are opportunities to relax and swim in the river, explore the Nantahala National Forest and enjoy the mountains of North Carolina.

Section Total (15 out of 15)	100%
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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.

1. Does your medical school and/or institution have an Office of Sustainability?	
3	Yes, there is an Office of Sustainability with multiple full-time staff dedicated to campus sustainability. If the Office of Sustainability serves the entire campus, there is at least one designated staff member for sustainability at the hospital and/or medical school.
2	There is an Office of Sustainability with one or more full-time staff dedicated to campus sustainability, but no specific staff member in charge of medical school and/or hospital sustainability.
1	There are no salaried sustainability staff, but there is a sustainability task force or committee
0	There are no staff members or task force responsible for overseeing campus sustainability
<p><i>Score explanation: Emory University has an Office of Sustainability Initiatives currently led by Kelly Weisinger, which is responsible for institution-wide endeavors for sustainability and was started in 2006. The School of Medicine has several sustainability liaisons, Shelby Smith, Erica Weaver, and Meg Ahrens, who represent Emory's sustainability initiatives within the School of Medicine. Hannah Hoff and Travis Wilson serve as MSCA's sustainability co-chairs.</i></p>	

2. How ambitious is your medical school/institution's plan to reduce its own carbon footprint?	
4	The institution has a stated goal of carbon neutrality by 2030 or earlier and the medical school / institution has a well-defined and adequate plan in place to achieve this goal.
3	Yes, there is a stated carbon neutrality goal by at least 2040 and the medical school/institution has a well-defined and adequate plan in place to achieve this goal.
2	Yes, there is a stated carbon neutrality goal by at least 2040, but the medical school/institution has not created a plan to reach that goal or the plan is inadequate.
1	There is a CO2 emission reduction goal, but it is not one of carbon neutrality.
0	There is no stated goal for reduction of CO2 emissions.

Score explanation: Emory's Sustainability Vision and strategic plan incorporates the climate action plan for the institution and Emory University has clearly stated goals regarding reduction of emissions. "In alignment with the IPCC, [Emory commits to] reducing greenhouse gas emissions 45% by 2030 and reaching net zero emissions by 2050, using a 2010 baseline. Emory also plans to achieve carbon neutral construction by 2025 and to reduce emissions from purchased electricity." As the timeline for the plan is calibrated for 2050, they receive a score of 2 rather than 3 – these initiatives require additional resource allocation and administrative support to achieve these goals for carbon reduction.

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: Emory has plans to self-generate 10% of energy used on campus to replace fossil fuel sources by 2025, but currently does not meet over 20% of its energy needs with renewable energy sources. The ability to do this is very dependent on regional barriers that are beyond a medical school's control, such as regulatory and utility leadership. Given some of these constraints, however, Emory has instituted sustainable technologies for producing across its campus, including solar photovoltaic power, co-generation from Emory's steam plant, biofuel used in Emory's Cliff shuttles, and geothermal energy in the LEED Platinum Emory Student Center. Additionally, with the enactment of HB 57, The Solar Power Free-Market Financing Act of 2015, Georgia became the first state in the Southeastern U.S. to legislatively approve private, third party sales of electricity from onsite solar systems as a means of financing solar energy for Georgia businesses, institutions, schools and homes. With third party financing through Solar Energy Procurement Agreements (SEPA) now legal in Georgia, Emory has been able to install more cost effective solar energy systems on Emory property.

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.
<p><i>Score explanation: The University and Healthcare system have over 4.2 million gross square feet of space in 37 LEED certified buildings and in 2017, Emory University Hospital Tower was the first Emory Healthcare building to become LEED-certified. Furthermore, all new construction on campus will be carbon neutral and major building renovations will be held to a minimum of LEED Silver standards by 2025. There are also plans to ensure that major building renovations will be held to a minimum of LEED Silver standards, and roof replacement projects will be cool, green and/or solar. These metrics and further plans for sustainable change are documented accordingly here.</i></p>	

5. Has the medical school implemented strategies to encourage and provide environmentally-friendly transportation options for students and reduce the environmental impact of commuting?	
2	Yes, the medical school has implemented strategies to encourage and provide environmentally-friendly transportation options such as safe active transport, public transport, or carpooling and these options are well-utilized by students. Alternatively, the campus location is not amenable to unsustainable forms of transportation by default.
1	The medical school has implemented some strategies to provide environmentally-friendly transportation options, but the options are unsatisfactorily accessible or advertised.
0	The medical school has not implemented strategies to encourage and provide environmentally-friendly transportation options.
<p><i>Score explanation: Emory has committed to reducing emissions through investment in and implementation of sustainable transportation solutions.</i></p> <ul style="list-style-type: none"> ● <i>In 2005, Emory created the Cliff Shuttle system, which transports around 3 million riders annually to and from Emory facilities for free. The shuttles run on a B5 biofuel blend made from campus and hospital used cooking oils.</i> ● <i>Emory developed a robust commute options program that offers resources and incentives to employees who commute by walking, biking, carpooling, vanpooling and public transit.</i> ● <i>Electric vehicle charging stations and an Emory Fleet Service Rental program for Emory students, faculty and staff encourage sustainable travel options.</i> ● <i>Emory supports a bicycling culture for those who cycle to work and around campus, offering a bike rental program, staff and student bicycling social groups, and a free bike repair shop on campus.</i> <p><i>Emory's 2025 Sustainability Vision commits Emory to:</i></p> <ul style="list-style-type: none"> ● <i>Support flexible workdays so that all non-essential personnel are expected to telecommute at least one day per week by 2020.</i> ● <i>Improve air quality through enforcement of Emory's No Idling Policy and other pollution prevention actions.</i> ● <i>Shift Emory University and Emory Healthcare vehicle fleets to meet national sustainable fleet certification standards.</i> ● <i>Extend incentives for sustainable commuting to students and expand bike shares and the Cliff Shuttle.</i> 	

To see more information pertaining to Emory's sustainable transportation initiatives please see this [website](#).

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: Emory's campus, including the medical school, has a robust set of composting and recycling bins that are readily available for students to use. When it comes to [waste at Emory](#), they no longer offer landfill waste containers in exterior spaces of campus. The Emory Recycles department also accepts waste and recyclables for any disposable streams at the Recycling Drop Off site and is open 24/7. It has also partnered with other departments to collect hard to recycle materials such as light bulbs, batteries, aerosol cans, clean Styrofoam and electronic waste.

Moving forward, Emory's Sustainability Vision & Strategic Plan, 2025 includes the following action items:

- All university events will be zero municipal landfill waste by 2025.
- Divert 95% of non-construction waste from municipal waste landfills (except regulated lab and medical waste) by 2025.
- Compost, recycle, or reuse at least 95% of food waste, non-hazardous animal bedding, and construction materials by 2025. To learn more about how we aim to do this, visit our [ZLW page](#).
- Meet or exceed leading healthcare industry rates of waste reduction/reuse/recycling to 37% by 2025.

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: While the medical school does not have many food offerings, Emory University has several dining halls and cafeterias nearby that are accessible to medical students. In regards to these venues, Emory University has a Sustainable Food Committee that has a well-defined tracking system for their food purchases. This system, as outlined [here](#), analyzes the sustainability of their food purchasing based on four factors: locality, sustainability, scale, and independent ownership (vs. corporate purchases).

Additionally, The Oxford Organic Farm at Emory is a top 30 sustainable college-run farm that cultivates produce for Emory Dining, the Emory Farmers Market and a community-supported agriculture produce subscription program while providing a hands-on educational experience for students across disciplines.

Emory University also signed an MOU with The Conservation Fund's Working Farms Fund to break down barriers and support next-generation farmers across metro Atlanta while boosting the supply of fresh, local, sustainably grown food for Emory's campus and hospital communities.

Moving forward, Emory's Sustainability Vision & Strategic Plan commits Emory to:

- *Expand sustainable food purchases in Emory Dining to 75 percent by 2025.*
- *Expand sustainable and local food purchases in catered events.*
- *Expand sustainable and local food purchases in Emory Healthcare to 25 percent and establish a tracking system to document future gains.*

Further initiatives could continue to emphasize the health benefits of replacing meat consumption with sustainable eating habits within the SOM.

8. Does the medical school or associated institution apply sustainability criteria when making decisions about supply procurement?

3	Yes, the medical school has adequate sustainability requirements for supply procurement and is engaged in efforts to increase sustainability of procurement.
2	There are sustainability guidelines for supply procurement, but they are insufficient or optional. The medical school is engaged in efforts to increase sustainability of procurement.
1	There are sustainability guidelines for supply procurement, but they are insufficient or optional. The medical school is not engaged in efforts to increase sustainability of procurement.
0	There are no sustainability guidelines for supply procurement.

Score explanation: Emory provides comprehensive sustainability criteria for supply procurement provided on campus as detailed on this [website](#).

In addition to the purchasing standards mentioned in Section 7 regarding food, a few of the pertinent points to date from the website above are listed below:

- *In 2013, Emory became a founding member of the Sustainable Purchasing Leadership Council, a non-profit organization whose mission is to support and recognize purchasing leadership that accelerates the transition to a prosperous and sustainable future.*

- *Emory contracts require minimum standards governing employee wages, benefits, and working conditions, and provides increased access to minority, disadvantaged, and women-owned vendors.*
- *The purchase of polystyrene products is banned using Emory funds.*
- *Emory uses Life Cycle Cost Analyses to evaluate all energy and water-using products, systems, and building components.*
- *All new IT equipment purchased by Emory is EPEAT or Energy Star Certified.*

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: Emory University has a Sustainable Events Certificate that event planners can apply for that provides access to guidance on sustainable event planning, recognition for your efforts, and an opportunity to win a \$100 Emory Catering gift card, as per this [website](#). The certification [application](#) process is thorough and offers two levels of certification depending on how many criteria are met. This is currently an optional process and incentivized by the opportunity to win a \$100 gift card, but Emory intends to have all University events reach Zero Landfill Waste by 2025 and all University functions to be plastic bottle free by 2025.

Additionally, the Office of Sustainability Initiatives hosts a Sustainable Events Symposium in partnership with University Events, Michael C. Carlos Museum, Emory Catering, and America to Go. This is an opportunity for faculty, staff, and student event planners to sample sustainable catering while learning about sustainability and wellness. The most recent symposium featured Dr. Sharon Bergquist who presented the keynote address on Food as Medicine: The Power of Plant-Based Nutrition.

10. Does your medical school have programs and initiatives to assist with making lab spaces more environmentally sustainable?

2	Yes, the medical school has programs and initiatives to assist with making lab spaces more environmentally sustainable.
1	There are guidelines on how to make lab spaces more environmentally sustainable, but not programs or initiatives.
0	There are no efforts at the medical school to make lab spaces more sustainable.

Score explanation: Emory University has a program called [Green Labs at Emory](#), which is essentially a voluntary program that assists Emory University, Healthcare research, and teaching laboratories to outfit their labs with sustainable practice patterns. The six main criteria that the program uses to measure sustainability are:

1. *Energy and water efficiency and conservation*
2. *Recycling and waste reduction*
3. *Chemicals*
4. *Procurement*
5. *Engagement*
6. *Safe, Healthy, and Just Environment*

Labs fill out the Green Labs at Emory Checklist and the companion Green Labs at Emory Guidance Document. They then send this data to the Green Labs at Emory Team, which will award them with a certification level. Labs can then apply for funding to implement action items or come up with innovative ways to improve the sustainable practices of their lab.

Furthermore, the School of Medicine recently demonstrated its commitment to sustainability through this program and got its anatomy lab certified through the efforts of Irene Liu, Gilda Rastegar, Dr. Phillipsborn, and Dr. McKeon. The anatomy lab received a bronze level status, and this team is working on improving and implementing changes.

11. Does your institution’s endowment portfolio investments include fossil-fuel companies?

4	The institution is entirely divested from fossil fuels and has made a commitment to reinvest divested funds into renewable energy companies or renewable energy campus initiatives.
3	No, the institution is entirely divested from fossil fuels.
2	The institution has partially divested from fossil fuel companies 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: According to Emory University’s 2025 Sustainability Vision Document, “Emory University does not currently hold direct stock or bonds in public companies producing fossil fuels. Emory performs quarterly negative screening of its investment portfolio. Emory holds many investments in sustainable businesses and businesses with exemplary sustainability performance.” For clarification, Emory technically did not divest from fossil fuels as they did not invest in them to begin with.

Of note, less than 1% of Emory’s investment pool lies in positive sustainability investments currently. Moving forward, Emory would stand to benefit from making more positive investments in green tech, conservation, renewable power, energy optimization, and energy efficiency.

For more information regarding Emory’s fossil-fuel divestment and sustainability investments, please visit this [website](#).

Section Total (24 out of 31)	77.4%
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Back to summary page [here](#)

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%

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

Planetary Health Grades for the Emory University School of Medicine

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

Section	Raw Score	Letter Grade
Planetary Health Curriculum (30%)	$(58 / 69) \times 100 = 84.0\%$	A-
Interdisciplinary Research (17.5%)	$(17 / 17) \times 100 = 100 \%$	A+
Community Outreach and Advocacy (17.5%)	$(12 / 14) \times 100 = 85.7\%$	A
Support for Student-led Planetary Health Initiatives (17.5%)	$(15 / 15) \times 100 = 100\%$	A+
Campus Sustainability (17.5%)	$(24 / 31) \times 100 = 77.4\%$	B+
Institutional Grade	88.7%	A

Report Card Trends

Section Overview

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

