



Planetary Health Report Card:

UNC School of Medicine



2020-2021 Contributing Team:

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Summary of Findings

Curriculum	C-
<ul style="list-style-type: none"> • Strengths: Planetary health (PH) connections are mentioned briefly in the respiratory and renal blocks, the patient-centered care course, and in the microbiology coil. Faculty have been very enthusiastic about including these slides. Additionally, there are a few elective opportunities for students to explore PH issues. • Areas for improvement: PH connections in the curriculum could be made more explicit, with more dedicated time. The medical school could identify PH as a priority theme and include that material in learning objectives for each block. For example, the impact of pollution and toxins would be an excellent addition to PH curriculum in the reproductive and endocrine blocks. 	
Interdisciplinary Research	B+
<ul style="list-style-type: none"> • Strengths: UNC SOM has the benefit of being a member of a strong research institution with excellent work in planetary health (PH) related issues such as air quality and asthma being done by SOM faculty. • Areas for improvement: An excellent opportunity for improving awareness and resources would be to join the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education. Additionally, the SOM could develop an explicit process by which communities disproportionately affected by climate change or environmental injustice in NC could have input or make decisions about PH research agendas. 	
Community Outreach and Advocacy	D
<ul style="list-style-type: none"> • Strengths: UNC Health, affiliated with the SOM, is a partner with Clean Air Carolina. • Areas for improvement: As there is a lack of patient education materials on PH issues at the hospital and other UNC Health sites, the SOM could participate in crafting online materials, physical brochures, classes, etc. for NC. In addition, there is opportunity to create PH-related CME courses and to partner with Gillings or other areas of UNC to host public education events. 	
Support for Student-Led Initiatives	B-
<ul style="list-style-type: none"> • Strengths: Overall, the administration at UNC SOM is very supportive of student-led PH initiatives, offering their time and enthusiasm for student work and responsively starting to include more slides about PH issues into applicable material in PCC and the renal, cardio, respiratory blocks and the microbiology coil. Funding for the student-led PH advocacy group, CLEAN Med UNC, is pending. • Areas for improvement: The administration could further support student-led initiatives by facilitating connections between research mentors and students, creating grant opportunities, and developing a student fellowship program designated for PH. The SOM has an excellent bank of researchers in PH and could make medical students more aware of their work with opportunities for student involvement. 	
Sustainability	D
<ul style="list-style-type: none"> • Strengths: The SOM has the benefit of the use of newer UNC buildings with updated sustainable designs, such as the use of rainwater salvage systems. • Areas for improvement: The biggest step UNC could take towards improving medical school specific campus sustainability would be to develop sustainability guidelines for event planning (including choice of food, beverages, supply procurement, etc). 	

Statement of Purpose

Planetary health is human health.

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

As future health professionals, we must be prepared to address the impacts of human-caused environmental changes on our patients’ health. This preparation is in the hands of the institutions providing our medical training. It is imperative that we hold our institutions accountable for educating medical students about the health impacts of climate change and other anthropogenic environmental changes, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices as much as possible, and engaging with surrounding communities that are most affected by environmental threats. Because climate change and environmental threats disproportionately affect vulnerable populations (for example, communities of color, older adults sensitive to health threats, and individuals in low-resource settings), these issues are inherently ones of equity and justice.

With the purpose of increasing planetary health awareness and accountability among medical schools, we have created a Planetary Health Report Card that medical students internationally can use to grade and compare their home institutions on an annual basis. This medical-student-driven initiative aims to compare medical schools on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) interdisciplinary research in health and environment, 3) university support for student planetary health initiatives, and 4) community outreach centered on environmental health impacts 5) medical school campus sustainability.

Planetary Health Curriculum

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

Curriculum: General

1. Did your medical school offer elective courses to engage students in Education for Sustainable Healthcare or Planetary Health in the last year?	
3*	Yes, the medical school has offered more than one elective whose primary focus is ESH/planetary health in the past year.
2	Yes, the medical school has offered one elective whose primary focus is ESH/planetary health in the past year.
1	The medical school does not have any electives whose primary focus is ESH/planetary health, but there are one or more electives that include a lecture on planetary health.
0	No, the medical school has not offered any electives on planetary health or electives that include ESH/planetary health topics in the past year.
<p><i>Score explanation: There were no electives offered in the past year focusing solely on planetary health. Planetary health issues (e.g., pollution, migration) are sometimes touched on in electives related to social determinants of health, but they are not the focus of any elective offered. During some electives, students have the opportunity to choose their own topics to explore for projects or papers and may have the opportunity to choose topics related to planetary health.</i></p>	

Curriculum: Health Effects of Climate Change

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

1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: Content on heat-related risks of nephrolithiasis and acute kidney injury was briefly incorporated into the Renal block for the first time this year. Additionally, heat-related illness is a topic that was addressed briefly as part of an elective social medicine course on incarceration and health. However, there are no elective opportunities dedicated solely to health impacts of climate change, including heat-related illnesses.</i></p>	

3. Does your medical school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The impact of hurricanes on access to dialysis is a topic that was briefly incorporated into the Renal block this spring along with other planetary health content.</i></p>	

4. Does your medical school curriculum address the impact of climate change on the changing patterns of infectious diseases?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The impact of climate change on changing patterns of infectious diseases is discussed at various points of the longitudinal Microbiology preclinical curriculum. Specifically, the likelihood of increased disease incidence in the United States due to climate change is mentioned in the</i></p>	

context of Chagas disease, mosquito-borne diseases, and endemic fungal pathogens. Updates to the curriculum are largely based on the CDC website's prevalence maps.

5. Does your medical school curriculum address the cardiorespiratory health effects of climate change, including 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: The core preclinical curriculum addresses air pollution as a major respiratory health hazard during the Respiratory/Pulmonology block. Air pollution is discussed in the context of industrial toxins, especially in developing countries, and also with regard to wildfires. Fine particulate matter, ozone, sulfur dioxide, nitrogen dioxide, and airborne lead and their respective respiratory health impacts are discussed. The core curriculum does less to highlight the impact of air pollution on cardiovascular health with "pollution" mentioned briefly in the context of environmental or epigenetic factors that may play a role in cardiovascular disease.

6. Does your medical school curriculum address the mental health and neuropsychological effects of environmental degradation and climate change?

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

Score explanation: The potential mental health effects of environmental degradation and climate change are not addressed in the preclinical curriculum mental health / psychiatry lecture content.

7. Does your medical school curriculum address the relationships between health, individual patient food and water security, ecosystem health, and climate change?

3	This topic was explored in depth by the core curriculum.
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2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: The current preclinical core curriculum does not address the relationships between individual patient food security, ecosystem health, and climate change. However, interested students may choose to explore these topics through the Humanities and Social Sciences Scholarly Concentration and/or the Nutrition Scholarly Concentration.</i></p>	

8. Does your medical school curriculum address the outsized impact of climate change on marginalized populations such as those with low SES, women, communities of color, children, homeless populations, and older adults?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation: One option for students in their third-semester elective for Social and Health Systems is Health and Human Rights. This course includes discussion dedicated to climate change and human rights, and students prepare for this discussion by reading two relevant materials: 1) "Climate Change, Human Rights, and Social Justice" by Levy and Patz in Annals of Global Health, and 2) Chapter 14 of the Fourth National Climate Assessment by the US Global Climate Change Research Program. Additionally, students may choose to explore these topics through the Humanities and Social Sciences Scholarly Concentration. Of note, content related to these topic areas will likely be incorporated into the preclinical core curriculum's 'Social and Health Systems' class in coming years after discussions with faculty who are receptive to the idea.</i></p>	

9. Does your medical school curriculum address the unequal health impacts of climate change globally?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.

Score explanation: The current preclinical core curriculum does not address the unequal health impacts of climate change globally. However, interested students may choose to explore these topics through the Humanities and Social Sciences Scholarly Concentration and/or the Global Health Scholarly Concentration.

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

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

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

Score explanation: The effects of industry-related environmental exposures on pregnancy are not addressed in the preclinical Reproductive block. Discussion of toxic exposures as they relate to pregnancy is limited to teratogenic medications.

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

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

Score explanation: The impact of hurricanes in North Carolina on access to dialysis is a topic that has recently been incorporated into the Renal block along with other planetary health content.

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

3	This topic was explored in depth by the core curriculum.
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2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<i>Score explanation: To our knowledge, the preclinical curriculum does not currently cover the unique climate and environmental health challenges impacting Indigenous communities.</i>	

13. Does your medical school curriculum address the outsized impact of anthropogenic environmental toxins on marginalized populations such as those with low SES, women, communities of color, children, homeless populations, and older adults?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<i>Score explanation: During the Respiratory block, there is a brief slide linking asthma with risk factors associated with low SES, such as bugs in the home, stress, and urban air pollution.</i>	

Curriculum: Sustainability

14. Does your medical school curriculum address the environmental and health co-benefits of a plant-based diet?	
3	This topic was explored in depth by the core curriculum.
2	This topic was briefly covered in the core curriculum.
1	This topic was covered in elective coursework.
0	This topic was not covered.
<i>Score explanation: Pre-clinical nutrition lectures tend to focus on the health benefits of various diets (i.e., Mediterranean diet, DASH diet) as evidenced by clinical study outcomes. The Mediterranean diet</i>	

is promoted in lecture material as a healthful diet because a large component is fruits, vegetables and legumes, but the environmental impacts are not addressed. A purely plant-based (“vegan”) diet is mentioned in some lecture materials as potentially beneficial for certain diseases (e.g., diabetes), but lectures do not go further in discussing this diet. A summer elective class in culinary medicine did not address environmental impacts of diet. Content in the Nutrition Scholarly Concentration acknowledges in passing that some diets are more environmentally friendly, but spends little to no time on these aspects.

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

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

Score explanation: This metric is met by an optional project for clinical-phase students as part of their longitudinal Social and Health Systems curriculum. The optional project gives students flexibility to pursue various topics related to sustainable best practices, including: 1) ways healthcare systems impact the environment and how to mitigate these effects, 2) the role of agribusiness in hospital food systems, or 3) other hospital systems' approaches to sustainable healthcare and climate adaptation and how these models can be applied to UNC.

Curriculum: Clinical Applications

16. In training for patient encounters, does your medical school’s curriculum introduce strategies to have conversations with patients about the health effects of climate change?

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

Score explanation: The Patient Centered Care course, which teaches clinical skills during the pre-clinical semesters, does not address climate change or teach strategies for having conversations with patients about climate change.

17. In training for patient encounters, does your medical school’s curriculum introduce strategies for taking an environmental history or exposure history?

2	Yes, the core curriculum includes strategies for taking an environmental history.
1	Only elective coursework includes strategies for taking an environmental history.
0	No, the curriculum does not include strategies for taking an environmental history.

Score explanation: The Patient Centered Care course includes instruction on how to take a history from patients regarding environmental exposures. One specific case that students utilize involves a patient with likely pneumonitis due to exposure to inhaled irritants through military work.

Curriculum: Administrative Support for Planetary Health

18. Is your medical school currently in the process of improving Education for Sustainable Healthcare (ESH)/planetary health education?

4	Yes, the medical school is currently in the process of making major improvements to ESH/planetary health education.
2	Yes, the medical school is currently in the process of making minor improvements to ESH/planetary health education.
0	No, there are no improvements to planetary health education in progress.

Score explanation: Individual faculty members have been extremely responsive to our suggestions for incorporating planetary health materials into their lectures on topics throughout the core curriculum, and several new elements (highlighted when relevant throughout this report) will be included by these individual faculty members over the next year. However, to our knowledge, no committee tasked with focusing on a planetary health curriculum has been formed.

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

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

Score explanation: UNC has no stand-alone lectures on planetary health concepts. Some planetary health content has been integrated within the core curriculum in respiratory, renal, patient-centered care, and social and health systems courses, but the appearance of this content is inconsistent and not equally present throughout all courses (for instance, relevant material is notably missing in the endocrine, reproductive, and behavioral health blocks).

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

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

Score explanation: UNC does not have a program offering incentives to faculty/departments with regards to planetary health curriculum content. According to a faculty member who has worked to incorporate planetary health content into her lectures, this was self-driven and in no way incentivized or promoted by the school.

Section Total (25 out of 58)	C-
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Are there additional curriculum resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

Interdisciplinary Research

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

1. Are there researchers engaged in planetary health research and healthcare sustainability research at your medical school?	
4	Yes, there are faculty members at the School of Medicine who have a primary research focus in planetary health and healthcare sustainability.
3	Yes, there are faculty members at the School of Medicine who have a primary research focus in a planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the School of Medicine who are conducting research related to planetary health or healthcare sustainability, but it is not their primary research focus.
1	There are planetary health and/or healthcare sustainability researchers at the institution, but none associated with the medical school.
0	No, there are no planetary health and/or healthcare sustainability researchers at the institution or medical school at this time.
<p><i>Score explanation: There are many researchers in planetary health at the UNC SOM. The Center for Environmental Health and Susceptibility at UNC has three main research areas in translational medicine: cardiopulmonary disease, developmental disease, environmental cancer. On the main CEHS website, the research co-directors' contact information is accessible, along with further links to explore research within planetary and human health correlates at the institution. For example, in the cardiopulmonary research focus, the Center for Environmental Medicine, Asthma, and Lung Biology within the School of Medicine has seven research labs (https://www.med.unc.edu/cemalb/). Many of the faculty members in the Curriculum in Toxicology focus on environmental health and are faculty of the School of Medicine. However, we were unable to find researchers who focus on healthcare sustainability.</i></p>	

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 CEHS in the UNC Gillings School of Global Public Health promotes multidisciplinary research in planetary health since its establishment 20 years ago. This center has four strategic [goals](#): 1) to facilitate translational research in cardiopulmonary disease, developmental disease, and environmental cancers, 2) to disseminate knowledge and technology across research groups working on environmental susceptibility, 3) to recruit and train environmental health science workforce in research and its translation, 4) to engage public health and community leaders to respond to environmental health threats facing North Carolinians and the United States.

The UNC Institute for the Environment (IE) also promotes multidisciplinary research, and it primarily focuses on air quality modeling and financial risk in environmental systems. However, IE works more on modeling and community engagement in environmental science, whereas CEHS works to demonstrate the connections between environmental health and human health.

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: There is no official process by which communities disproportionately impacted by environmental injustice give input or make decisions about the research agenda at the UNC SOM; however, one faculty member involved in research on air pollution and asthma said that there are ongoing efforts to “collaborate with community stakeholders” in at least one specific research project

shared by the SOM, the Gillings School of Public Health, and the Institute for the Environment, and ongoing grants for similar projects.

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

3	There is an easy-to-use, adequately comprehensive website that centralizes various campus resources related to health and the environment including all of the following: upcoming events, leaders in planetary health at your institution, and relevant funding opportunities.
2	There is a website that attempts to centralize various campus resources related to health and the environment, but it is hard-to-use, not updated, or not adequately comprehensive.
1	The institution has an Office of Sustainability website that includes some resources related to health and the environment.
0	There is no website.

Score explanation: UNC Institute for the Environment (IE) is a hub to demonstrate the environmental contributions and efforts by the university. The [IE website](#) explains its purpose to help university departments, centers, and schools “to join together in interdisciplinary research, education and engagement, and creates new areas of study” in response to environmental issues. More specifically related to human health, the Center for Environmental Health and Susceptibility (CEHS), through the Gillings School of Global Public Health, is a center for advancing environmental health research to improve human health in North Carolina. The main [CEHS website](#) has resources related to center membership, translational research, publications and events, and community engagement. This center and website are interdisciplinary, reflecting the relationships among laboratory models, individuals, and communities.

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

4	Yes, the institution has hosted more than one conference or symposium on topics related to planetary health in the past year, including at least one on climate change.
3	Yes, the institution has hosted one conference or symposium on topics related to planetary health in the past year.
2	Yes, the institution has hosted a conference on topics related to planetary health in the past three years.
1	The institution has not hosted any conferences directly, but they have provided financial support for a local planetary health event.

0	No, the institution has not hosted a conference on topics related to planetary health in the past three years.
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Score explanation: Annually since 2012 UNC has hosted a Water and Health conference (<https://waterinstitute.unc.edu/conferences/>) covering a wide range of topics. Despite the COVID-19 pandemic in October 2020, UNC continued to host a conference virtually with over 2000 registrants from 90 countries. The agenda for 2020's conference covered topics related to water sanitation and SARS-CoV-2, as well as temperature and precipitation effects on E. coli levels in drinking water. Additionally, the UNC Water Institute has used a greater interdisciplinary approach in their 2014 and 2018 "Nexus: Water, Food, Energy, Climate" conferences. UNC's IE also hosted its 19th annual Community Modeling and Analysis System (CMAS) conference that works to develop air quality modeling technology. The CMAS primary goals are to build models, develop datasets, analyze results, and understand model behavior, and these models are helpful tools to analyze the air quality impact on human health.

6. Has your institution or medical school joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education?	
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2	Yes, the medical school has joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education.
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1	Yes, the institution has joined the Planetary Health Alliance and/or the Global Consortium on Climate and Health Education, but the medical school specifically has not.
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0	No, the institution has not joined the Planetary Health Alliance or the Global Consortium on Climate and Health Education.
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Score explanation: Gillings School of Global Public Health (UNC-Chapel Hill) is a member of the Global Consortium on Climate Health and Education, but neither the School of Nursing nor the School of Medicine at UNC are members of the GCCHE. UNC is not a Planetary Health Alliance member. (Academic institution PHA members are listed [here](#) and consortium members are listed [here](#).)

Section Total (15 out of 19)	B+
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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: UNC Health Care is listed as a partner with Clear Air Carolina (https://cleanaircarolina.org/who-we-are/)</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: UNC in partnership with the North Carolina Museum of Natural Sciences offers the Youth Engaged in the Science of Resilience Program which is a free year-long program for high school students centered around the issue of climate change, including the completion of a final project focused on building resilience against the local impacts of climate change within the community. The program is ongoing and is currently operating virtually (<https://ie.unc.edu/yes-resilience/>). Additionally, the UNC Gillings School of Global Public Health developed an online self-study module available to the community for free, providing information on how air pollution is exacerbated by extreme heat (<https://www.train.org/main/course/1089727/>).

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: A search of Vital Signs, the UNC Health newsletter received by professionals and students, yielded a few announcements about available resources or talks about environmental health and health equity.

4. Does the medical school offer continuing medical education (CME) courses that address planetary health and/or sustainable healthcare?

2	Yes, multiple in-person or online CME courses relating to planetary health and/or sustainable healthcare are offered, including at least one with a primary focus of planetary health.
1	Yes, one in-person or online CME course related to planetary health and/or sustainable healthcare is offered.
0	There are no CME courses on planetary health or sustainable healthcare topics.

Score explanation: The university does not maintain a central list of CME courses. When communicating with the CME director in regards to continuing education courses that address planetary health, he reported that he was not aware of any such activities.

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

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

Score explanation: After contacting UNC Patient Information and Pulmonary Care, we were not able to locate any educational materials for patients about environmental health exposures.

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

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

Score explanation: We were unable to find any educational materials for patients, including those resources online.

Section Total (4 out of 14)	D
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Are there additional community engagement and advocacy resources offered at your medical school or institution not yet asked about that you would like to describe? If so, please do so below.

Support for Student-Led Planetary Health Initiatives

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

1. Does your institution offer support for medical students interested in enacting a sustainability initiative?	
2	Yes, the institution offers grants available to medical students for students to enact sustainability initiatives.
1	The medical school encourages sustainability QI projects (to fulfill clerkship or longitudinal requirements) and offers resources to help students succeed in these projects, but there is no student funding available.
0	No, the institution does not offer opportunities or support for sustainability initiatives.
<p><i>Score explanation: Students are required to complete QI projects to fulfill clerkship requirements, and they may choose to focus on sustainability, but there are no specific funding or extra resources available to help with these projects specifically.</i></p>	

2. Does your institution offer opportunities for medical students to do research related to planetary health and/or sustainable healthcare?	
3*	The institution offers an explicit paid fellowship for medical students to do research related to planetary health and/or sustainable healthcare.
2	The institution offers paid research opportunities for students and planetary health/sustainable healthcare projects would be considered eligible.
1	There are unfunded research opportunities for students to perform research related to planetary health/sustainable healthcare.
0	There are no opportunities for students to receive funding for planetary health/sustainable healthcare research.
<p><i>Score explanation: There are currently no planetary health fellowship opportunities available at UNC. UNC SOM has resources available to those interested in research and initiatives including those</i></p>	

regarding planetary health. The Carolina Medical Student Research Program (CMSRP) is a program available to medical students to fund research projects. Planetary health/sustainable healthcare projects would be considered eligible for application.

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

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

Score explanation: The Carolina Medical Student Research Program (CMSRP) website (<https://www.med.unc.edu/omsr/resources-for-students/find-a-mentor/>) contains a section entitled "Find a Mentor" that includes faculty projects and interests. These faculty have information listed regarding current project status, funding, and contact information. Some of these involve planetary health. However, the site does not specifically highlight planetary health mentors.

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

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

Score explanation: UNC SOM has an active and growing student group called "Climate Leadership and Environmental Action Network (CLEAN)" which is faculty supported but still awaiting funding.

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

1	Yes, there is a student representative that serves on a medical school or institutional decision-making council.
0	No, there is no such student representative.

Score explanation: There is no formal position for such a student liaison at this point.

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

1	Projects where students are able to gain experience in organic agriculture and sustainable food systems, such as gardens, farms, community supported agriculture (CSA), fishery programs, or urban agriculture projects.
1	Panels, speaker series, or similar events related to planetary health that have students as an intended audience.
1	Events in which students learn directly from members of a local environmental justice community about the climate and environmental challenges they face, and how health professionals can partner with their community to address these exposures and impacts.
1	Cultural arts events, installations or performances related to planetary health that have students as an intended audience.
1	Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts.
1	Wilderness or outdoors programs (e.g., that organize hiking, backpacking, kayaking, or other outings for students) that follow Leave No Trace principles.

Score explanation:

The Carolina Community Garden hosts workdays that are open to volunteers from all faculty and students (including those from the School of Medicine).

CLEAN Med UNC has already hosted at least one speaker on cardiovascular disease and environmental pollution geared towards medical students. The Gillings School of Global Public Health hosts multiple speaker series throughout the year spotlighting the connection between health and environmental pollution or climate change, and these are open to all interested attendees.

The Center for Resilient Communities and Environment is a newly formed organization underneath the UNC Institute for the Environment and will have resources for student volunteer opportunities.
<https://ie.unc.edu/research/crce/>

Campus recreation facilities are open to medical students and host wilderness outings that follow Leave No Trace principles.

Section Total (9 out of 15)

B-

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

Campus Sustainability

Section Overview: This section evaluates the support and engagement in sustainability initiatives by the medical school and/or institution. The healthcare industry is a major contributor to greenhouse gas emissions as well as pollution that harms local, regional, and global ecosystems. While healthcare is, by nature, a resource-intensive endeavor, the healthcare sector is well poised to lead the world to a more sustainable future. This will involve scrutinizing every aspect of how our systems operate, from where we source our energy, to how we build our infrastructure, to what companies we invest in. Our medical schools, clinics, and hospitals must set the standard for sustainable practices, and show other sectors what is possible when it comes to minimizing environmental impact.

1. Does your medical school and/or institution have an Office of Sustainability?	
3	Yes, there is an Office of Sustainability with multiple full-time staff dedicated to campus sustainability. If the Office of Sustainability serves the entire campus, there is at least one designated staff member for sustainability at the hospital and/or medical school.
2	There is an Office of Sustainability with one or more full-time staff dedicated to campus sustainability, but no specific staff member in charge of medical school and/or hospital sustainability.
1	There are no salaried sustainability staff, but there is a sustainability task force or committee
0	There are no staff members or task force responsible for overseeing campus sustainability
<p>Score explanation: The UNC Office of Sustainability has full-time staff dedicated to campus sustainability, but no branch member for the medical school or hospital: https://threezeros.unc.edu/about/</p>	

2. Does your medical school and/or institution have a stated goal of carbon neutrality by 2050?	
4*	The medical school is already carbon neutral.
3	Yes, there is a stated carbon neutrality goal and the medical school has a well-defined and adequate plan in place to achieve this goal.
2	Yes, there is a stated carbon neutrality goal, but the medical school has not created a plan to reach that goal or the plan is inadequate.
1	There is a CO2 emission reduction goal, but it is not one of carbon neutrality.
0	There is no stated goal for reduction of CO2 emissions.

Score explanation: The institution of UNC as a whole has a stated carbon neutrality goal (by 2050), but the SOM is not specifically involved in this plan.

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: To our knowledge, although there are plans to incorporate renewable energy on UNC's campus broadly in the future, the current SOM buildings do not use any renewable energy sources.

4. Are sustainable building practices utilized for new and old buildings on the medical school campus, with design and construction of new buildings and remodeling of old buildings conforming to a published rating system or sustainable building code/guideline?

3	Yes, sustainable building practices are utilized for new buildings on the medical school campus and the majority of old buildings have been retrofitted to be more sustainable.
2	Sustainable building practices are utilized for new buildings on the medical school campus, but most old buildings have not been retrofitted.
1	Sustainable building practices are inadequately or incompletely implemented for new buildings.
0	Sustainability is not considered in the construction of new buildings.

Score explanation: Newer buildings partially used by the UNC SOM (such as Marsico) utilize sustainable building practices such as rainwater salvage systems and are LEED certified; however, older buildings used by the School of Medicine have not been retrofitted.

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: Although medical students in Chapel Hill often utilize the bus system or biking paths during preclinical years, there is no specific strategy implemented by the SOM to encourage the use of these options or other alternatives during clinical years, especially when students must drive to clinical sites across the state. In fact, students are officially told that they must have access to a personal vehicle for the clinical years. The branch campuses, including Asheville, have virtually zero environmentally-friendly transportation options.</i></p>	

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.
<p><i>Score explanation: There are recycling bins available throughout campus, but no concerted effort to provide composting options.</i></p>	

7. Does the medical school apply sustainability criteria when making decisions about the campus food and beverage selections?	
3	Yes, the medical school has adequate sustainability requirements for food and beverages and is engaged in efforts to increase food and beverage sustainability.
2	There are sustainability guidelines for food and beverages, but they are insufficient or optional. The medical school is engaged in efforts to increase food and beverage sustainability.

1	There are sustainability guidelines for food and beverages, but they are insufficient or optional. The medical school is not engaged in efforts to increase food and beverage sustainability.
0	There are no sustainability guidelines for food and beverages.
<i>Score explanation: Upon reaching out to Student Affairs, we were told that the UNC SOM has not heretofore considered sustainability when planning events in terms of food/beverages, etc.</i>	

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.
<i>Score explanation: We were unable to find guidelines for supply procurement considering sustainability beyond that required by the state for the university at large, and it appears that the School of Medicine likewise has no sustainability guidelines for supply procurement.</i>	

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.
<i>Score explanation: Upon reaching out to Student Affairs, we were told that the UNC SOM has not heretofore considered sustainability when planning events.</i>	

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

environmentally sustainable?	
2	Yes, the medical school has programs and initiatives to assist with making lab spaces more environmentally sustainable.
1	There are guidelines on how to make lab spaces more environmentally sustainable, but not programs or initiatives.
0	There are no efforts at the medical school to make lab spaces more sustainable.
<p><i>Score explanation: Green Labs is an interdisciplinary committee focused on improving sustainability in the lab setting across all labs at UNC, including those affiliated with the SOM.</i> https://uncgreenlabs.web.unc.edu/about/</p>	

11. Does your institution's endowment portfolio investments include fossil-fuel companies?	
4	The institution is entirely divested from fossil fuels and has made a commitment to reinvest divested funds into renewable energy companies or renewable energy campus initiatives.
3	No, the institution is entirely divested from fossil fuels.
2	The institution has partially divested from fossil-fuel companies.
1	The institution has not divested from fossil-fuel companies, but faculty and/or students are conducting organized advocacy for divestment.
0	Yes, the institution has investments with fossil-fuel companies and there have been no efforts to change that.
<p><i>Score explanation: There has been concerted effort on the part of students and faculty at UNC-Chapel Hill to encourage divestment since the early 2010s, but it has so far been unsuccessful:</i> https://www.dailytarheel.com/article/2020/10/university-feature-reinvest-club</p>	

Section Total (10 out of 29)	D
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Grading

Section Overview

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

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

Planetary Health Grades for the UNC School of Medicine

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

Section	Raw Score	Grade
Planetary Health Curriculum (30%)	25 / 58 = 43%	C-
Interdisciplinary Research (17.5%)	15 / 19 = 79%	B+
Community Outreach and Advocacy (17.5%)	4 / 14 = 29%	D
Support for Student-led Planetary Health Initiatives (17.5%)	9 / 15 = 60%	B-
Campus Sustainability (17.5%)	10 / 29 = 34%	D
Institutional Grade	48%	C

