



Planetary Health Report Card (Pharmacy):

*Virginia Commonwealth University
School of Pharmacy*



VCU

School of Pharmacy

2022-2023 Contributing Team:

Students: Kayla Pangilinan, Ladan Karim-Nejad, Briton Vanmaanen, Nathan Pal, Allison Gallagher

Faculty Mentors: Dr. Joseph Dipiro

Primary Contact: Ladan Karim-Nejad, karimnejadl@vcu.edu

Summary of Findings

Overall	D+
<u>Curriculum</u>	D-
<p>Utilizing the method of reaching out to course coordinators to offer their insights on their respective metrics was very helpful to making sure our experience as students was accurate to the score that we awarded each metric. A common theme we found among the responses from various professors was their recognition of the importance of climate and health in the pharmacy curriculum; however, the most common barrier mentioned was the lack of specific interventions that can be made by pharmacists that can have an impact in mitigating the effects of climate and health. Another barrier also commonly expressed was the lack of time within the curriculum to include these important topics. Overall, this experience revealed a great deal of information and it was worthwhile to hear how much professors thought these topics were important.</p>	
<u>Planetary Health Research</u>	C
<p>Although there are many opportunities for research throughout the pharmacy student's career while at the School, there are no opportunities related in any sense to planetary health. If there was more encouragement for students to come up with their own research projects that can be proposed to faculty available for mentoring a project, potentially there would be more interest in climate and health research and this could have a positive impact on the overall variety of research coming out of the School.</p>	
<u>Community Outreach and Advocacy</u>	F+
<p>Richmond is a city with a rich history and the role of the School definitely has played a role in how things look today. There are many grass-roots community organizations that strive to increase engagement of the greater university with the local people that live in Richmond. We believe that there are many ways the School can promote student engagement in the greater Richmond community in addition to empowering the efforts of these community members in any way possible; especially with respect to health care access.</p>	
<u>Support for Student-Led Initiatives</u>	B
<p>The student body within the School is very supportive of each other and the School takes an interest when reaching out to promote events or celebrate news. From a climate and health perspective, the School does not connect with other initiatives going on at the university level that may be of interest to the School's student body. However, it is great that the culture at the School continues to produce students with leadership skills and independence to start movements and initiatives when there are gaps.</p>	
<u>Campus Sustainability</u>	D+
<p>The School does not overtly make any effort to increase campus sustainability. There are minor interventions such as re-education of recycling to students, faculty, as well as custodial staff that can make a significant impact in improving waste reduction efforts. Collaborating with the other health professional schools would be another great start because there may be efforts being done elsewhere that can be easily implemented at the School. There is little information shared regarding the greater University's effort to improve campus sustainability; however, these efforts can be shared and supported by the School if it were communicated. VCU Health is another opportunity and a separate entity, but has a strong relationship with the School, that can be another area where campus sustainability measures can be implemented based on what is being done at other institutions with more robust sustainability protocols.</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 analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth”[1]. This definition is intentionally broad, intended to encompass the multitude of ways that the environment can affect health, including water scarcity, changing food systems, urbanisation, 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 single biggest health threat facing humanity”[2] many pharmacy schools’ institutional priorities do not reflect the urgency of this danger to human health. Fossil-fuelled electricity and gas and medical or pharmaceutical products used in healthcare account for around 8% of the total global greenhouse gas footprint of healthcare[3] with pharmaceutical waste also providing a dangerous contaminant to our water systems [4]. Metered dose inhalers contribute 500g CO₂eq per dose [5], whilst air pollution causes 7 million deaths per year worldwide and exacerbates chronic respiratory disease [6]. Pharmacy therefore has a direct and detrimental impact on planetary health and this contradiction in patient care must be addressed and actioned.

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 pharmacy training. It is imperative that we empower those who are educating pharmacy 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, and hold those who are not accountable. Because climate change and environmental threats disproportionately affect vulnerable populations [7] (for example, communities of colour, 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 providing recommendations and opportunities for improvement among pharmacy schools, we have created a Planetary Health Report Card that pharmacy students internationally can use to grade and compare their institutions on an annual basis. This pharmacy-student-driven initiative aims to compare pharmacy schools nationally and internationally on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) planetary health research, 3) university support for student planetary health initiatives, 4) community outreach centred on environmental health impacts, and 5) pharmacy school campus sustainability.

Definitions & Other Considerations

Definitions:

- **Planetary Health:** is described by the *Planetary Health Alliance* as “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth” [1]. 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 pharmacy 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, values, confidence and capacity to provide environmentally sustainable services through health professions education. We define a health professional as a person who has gained a professional qualification for work in the health system, whether in healthcare delivery, public health or a management or supporting role and education as ‘the system comprising structures, curricula, faculty and activities contributing to a learning process’* [8]. Planetary Health Education is an integral part of this education rather than an end in itself. This is because knowledge about planetary health is required to fully understand the necessity of sustainable healthcare. It is also part of the broader knowledge needed to fully protect and promote health.
- **Pharmacy School vs. Institution:** When “pharmacy school” is specified in the report card, this only refers to the curriculum and resources offered by the school of pharmacy and does not include offerings from other parts of the university (for example, undergraduate departments [USA], other related departments e.g. Public Health, Population Health departments). In contrast, when “institution” is specified in the report card, we are referring to the university more broadly. Any resource reasonably accessible by pharmacy students, no matter where in the institution the resource comes from or if it is specifically targeted for pharmacy students, can meet this metric.
- **Community organisations:** For most institutions, there are existing groups that are not directly affiliated with the university and exist as a product of what the community the institution exists in cares about or needs. These specific community organisations

relevant to this report include those that are focused around some aspect of climate and health preservation. These community organisations can include but are not limited to local mutual aid initiatives, underserved-resource distribution groups, clean-up and nature conservation groups, community gardeners, and other environmental-related organisations. If your institution does not have access to local volunteerships with community groups, please report any community organisations your institution or school has collaborated with.

Planetary Health Curriculum

Section Overview: *This section evaluates the integration of planetary health topics into the pharmacy school curriculum. Today's pharmacy students will be on the frontlines of tackling the health effects of climate and other environmental changes. Therefore, it is critical that pharmacy students understand planetary health issues and principles.*

1. Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation:</i> Extreme heat is mentioned throughout courses in the context of drugs that cause increased sensitivity to heat or increased risk for photosensitivity, but it is not covered in reference to global warming in detail. Extreme weather events are not discussed in any other capacity besides causing drug shortages.</p>	

2. Does your pharmacy school curriculum address the environmental impact of medicines in terms of their pollution, ecological impact and contamination of water systems?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.

0	This topic is not covered.
<i>Score explanation:</i> In P3 year during the Self-Care module in Lecture Sun Induced Skin Disorders there was brief mention of reef-safe sunscreen.	

3. Does your pharmacy school curriculum address the health effects of pharmaceutical industry- and manufacturing-related environmental toxins?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation:</i> Not covered	

4. Does your pharmacy school curriculum address the carbon footprint of healthcare systems?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation:</i> Not covered	

5. Does your pharmacy school curriculum address the impact of climate change on the changing patterns of infectious diseases and increased antimicrobial resistance?

3	These topics are explored in depth by the core curriculum.
2	These topics are briefly covered in the core curriculum.
1	These topics are covered in elective coursework.
0	These topics are not covered.

Score explanation: In the Infectious Disease clinical module, there is mention of how increasing climate temperatures may lead to a wider spread of vector borne illnesses and of warming waters leading to the growth and spread of pathogenic bacteria. We also discuss how climate contributes to resistance and points were added from IDSA's statement on climate change and its impact on infectious diseases. The impact of climate on infectious disease is further discussed in the elective and the book club in that course.

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

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

Score explanation: In the Respiratory Therapeutics module there are mentions about the impact of air quality on COPD, but it lacks environmental context and mitigation strategies.

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

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

Score explanation: In discussions about risk factor for cardiovascular diseases, there is mention of air pollution and the disproportionate population affected by cardiovascular disease (ie. systemic racism) which influences proximity to pollution. The course coordinators are interested in promoting more discussion surrounding these topics however they are limited by the time constraints of the course as well as there being a lack of specific interventions that can be made to resolve these issues by pharmacists.

8. Does your pharmacy school curriculum address the relationship between climate change and allergies?

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

Score explanation: Not covered.

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

3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation: Not covered.</i>	

10. Does your pharmacy school curriculum address the unequal regional health impacts of climate change nationally and globally, including the impact of social inequality?

3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic was not covered.
<p><i>Score explanation:</i> In the interprofessional course offered to P1s, “Foundations of Interprofessional Collaborative Care” aka IPEC 501, there is mention of social inequality but not in the context of environmental degradation and climate change or on any larger scale beyond the health system.</p> <p>In P1 course Health Promotion and Communication (PHAR 652) there is also brief mention about social inequality and how to communicate with impacted patients on topics related to transportation barriers and food insecurity from a social but not environmental standpoint.</p>	

11. Does your pharmacy school curriculum address the relationship between climate change and social determinants of health (e.g., reduced nutritional value of food)?

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

Score explanation: One guest speaker in a lecture titled “social determinants of health” in an elective course on Geriatric Pharmacy discussed the impact of redlining and other environmentally inequitable practices on the development of food deserts and lack of green space.

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

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

Score explanation: In the course PHAR652 where diabetes education is taught, there is brief mention of the impact of different types of diets on diabetes related measures and how lifestyles impact overall health.

**13. Does your pharmacy school curriculum cover these components of sustainable clinical practice?
(1 point each)**

1	Waste production within the healthcare system and strategies for reducing waste in clinical activities such as single use plastic and packaging.
1	Patient counselling on safe disposal of medications. For example, what can be disposed of and how to locate recycling schemes, in addition to certain drugs or drug classes that are most important to dispose of properly (e.g. hormonal contraceptives, drugs that are excreted unchanged/active metabolites).
1	The impact of extreme heat, on patients on medications which can interfere with thermoregulation
1	The impact of anaesthetic gases on the healthcare carbon footprint.
1	The environmental impact of pharmaceuticals and over-prescribing as a cause of climate health harm. Alternatively, teaching on de-prescribing where clinically appropriate and its environmental and health co-benefits would fulfil 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 impact and benefits of benign by design pharmaceuticals through exploring medicinal chemistry concepts and/or discussing implications of excretion of active metabolites/unchanged drug products on ecological systems
<p><i>Score explanation: Importance of non-pharm management for type 2 diabetes is covered extensively in Health Promotion and Communication (PHAR 652) class P1 year through the completion of Prevent T2 certification completed by all students. It is further discussed in Endocrine Therapeutics (PHAR 555) P2 fall.</i></p> <p><i>Patient counselling on safe disposal of medications: P1 year focuses a lot on patient counselling, however there is little to no focus on teaching patients how to dispose of the medication properly.</i></p>	

The environmental impact of pharmaceuticals and over-prescribing: deprescribing to reduce pill burden and improve health outcomes is discussed throughout all years, but there is no focus on the environmental benefit of deprescribing unnecessary therapies.

14. Does your pharmacy school curriculum discuss the environmental implications of various dosage forms, medication delivery devices, and/or excipients?

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

Score explanation: Within the Pharmaceutics and Biopharmaceutics course in P1 year in the Spring semester, there is brief discussion about the history of inhaler development where the history of transitioning from CFCs to HFAs, but with limited environmental impact on how the current aerosols are contributing emissions. Additionally, there are comparisons made between MDI and DPI devices; however, from a more patient-barrier perspective rather than from environmental impact.

15. In training for patient communication, does your pharmacy school's curriculum introduce strategies for having conversations with patients about the health effects of climate change?

3	Yes, there are clear and detailed strategies introduced for having conversations with patients about climate change in the core curriculum.
2	Yes, having conversations with patients about climate change is briefly mentioned in the core curriculum.
1	Yes, there are some examples of having conversations with patients about climate change in elective coursework.

0	No, there are not strategies or examples for having conversations with patients about climate change
<i>Score explanation: No strategies nor examples.</i>	

16. Does your pharmacy school curriculum guide students to consider the environmental impact of medications as a factor in addition to safety, efficacy, cost, and pill burden when comparing equivalent therapies?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation: Overall combination therapies are talked about from a clinical perspective to reduce pill burden, but not from an environmental perspective. Specifically combo pills for HIV and Parkinsons are discussed to reduce pill burden and cost. Combination therapies were also discussed in Respiratory Therapeutics to decrease the number of inhalers a patient has to administer to reduce confusion.</i>	

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

Score explanation: The curriculum committee is working on adding a course to the P2 curriculum known as the “Ethical Pharmacist” which will include topics related to sustainability and safe medication disposal, environmental effects/climate change and impacts on health, natural disasters and safe storage of medications, and potentially other related topics. P3 year, there are plans to include an interdisciplinary elective with the medical students that will allow more application and project work related to planetary health education.

18. Does your pharmacy school have a member of faculty to incorporate planetary health and sustainable healthcare as a theme throughout the curriculum ?

4	Yes, there is/are a member(s) of faculty whose role is directly responsible for the incorporation of planetary health and sustainable healthcare as a theme throughout the curriculum
2	Yes, there is/are member(s) of faculty who are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum as well as doing their principle role
0	There are no members of faculty who are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum

Score explanation: The curriculum committee which comprises 3 faculty members are working to include more planetary health topics in the curriculum, but they are also responsible for the entire curriculum anyway.

19. Does your pharmacy school curriculum offer clinical practice experiences (for example, IPPE/APPE rotations in the U.S. or placement opportunities in the UK) that allow for the exploration of planetary health topics?

3	There are multiple clinical practice experiences/placements that allow for direct exposure to planetary health topics.
2	There is one available clinical practice experience/placement that allows for direct exposure to planetary health topics.

1	There are available clinical practice experiences/placements that allow for indirect exposure to planetary health topics.
0	No, there are no such clinical practice experiences/placements available through the pharmacy school.

Score explanation: The school allows for students to create their own APPE rotation opportunities if the site and preceptor for such a practice experience exists and qualifies for one of the standards required by the ACPE. All opportunities available are geared toward clinical pharmacy and many students do not undertake the process of finding sites. During IPPE/APPE students can ask their preceptors for more specific projects related to their interests, but opportunities are overall limited to explore planetary health topics.

20. Does your pharmacy school curriculum acknowledge a disparity in the effects of climate change? Specifically, does your curriculum address groups more vulnerable to environmental impacts, such as BIPOC, immigrant groups, low income populations, children, elderly, persons with disabilities, persons with pre-existing or chronic medical conditions?

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

Score explanation: Currently there is no acknowledgement of populations more susceptible to the harmful impacts of climate change especially from an environmental context. There is a course called “Special Populations” but there is not much depth on how these populations are impacted by the environment.

Section Total (16 out of 66)	24%
-------------------------------------	------------

Planetary Health Research

Section Overview: *This section evaluates the quality and quantity of planetary health research at the school and with the 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. Pharmacy schools should support research in areas such as the health effects of climate change, adaptive measures and pharmacy's environmental impact.*

1. Are there researchers engaged in planetary health research and healthcare sustainability research at your pharmacy school?	
3	Yes, there are faculty members at the School of Pharmacy who have a primary research focus in planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the School of Pharmacy 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 pharmacy school.
0	No, there are no planetary health and/or healthcare sustainability researchers at the institution or pharmacy school at this time.
<p><i>Score explanation: Virginia Commonwealth University as an institution has an environmental science specific graduate and undergraduate program along with the VCU Center for Environmental Studies that have multiple publications and ongoing projects that are continuously being developed.</i></p>	

2. Has your institution recently provided extra curricular talks or learning opportunities on topics related to planetary health?	
4	Yes, the pharmacy school has hosted at least one opportunity for extra learning on topics related to planetary health in the past year.

3	Yes, the institution has hosted at least one opportunity for extra learning on topics related to planetary health in the past year.
2	Yes, the institution has provided at least one opportunity for extra learning on topics related to planetary health in the past three years.
1	The institution has not hosted anything directly, but they have provided financial support for a local planetary health event.
0	No, the institution has not hosted anything on topics related to planetary health in the past three years.

Score explanation: Through the student organization, Sustainable Pharmacy Project, the pharmacy school has hosted an event this year in collaboration with the University of California San Francisco pharmacy sustainability organization to bring awareness to the ways pharmacy plays a role in climate and health and ways students can get involved now in addition to how it translates to their future career as pharmacists.

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 pharmacy school?

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

Score explanation: No process nor efforts.

Section Total (5 out of 10)	50%
------------------------------------	------------

Community Outreach and Advocacy

Section Overview: *This section evaluates pharmacy 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 colour. 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 pharmacy school partner with community organizations to promote planetary and environmental health?	
3	Yes, the pharmacy school partners with multiple community organizations to promote planetary and environmental health to share opportunities for student involvement.
2	Yes, the pharmacy school partners with one community organization to promote planetary and environmental health to share opportunities for student involvement.
1	The institution partners with community organizations, but the pharmacy school is not part of that partnership.
0	No, there is no such meaningful community partnership.
<p><i>Score explanation: The student organization Sustainable Pharmacy Project (SPP) has collaborated with the local environmental organization Keep Virginia Cozy to pick up trash during a community litter clean up.</i></p> <p><i>VCU SoP's chapter of Student National Pharmaceutical Association (SNPhA) conducts Drug Take Back events for the community in partnership with local police. However, these events are more focused on drug diversion rather than the environmental impacts of improper drug disposal – yet, they help nonetheless.</i></p> <p><i>These events were not coordinated by the school and were entirely student-led.</i></p>	

2. Does your pharmacy school have coverage of issues related to planetary health and/or sustainable healthcare in their 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: There is a newsletter disseminated by the student organization Sustainable Pharmacy Project (SPP), but it has no association or support from the SoP. If there is an upcoming opportunity related to pharmacy in climate and health, then students share that with the school administrators to share with the rest of the School.

3. Is your pharmacy school a member of a national or international planetary health or ESH organisation?

1 Yes, the school is a member of a national or international planetary health or ESH organisation

0 No, the school is not a member of such an organisation

Score explanation: Not a member of such organisations.

Section Total (1 out of 6)

17%

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 opportunities for pharmacy 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: P3 students are given an opportunity to connect with a faculty member and work on an independent research project available for credit Spring and Fall semesters. The topic is up to the discretion of the faculty mentor and the student. For example, there is a student working on reducing Foundations lab waste.</i></p> <p><i>The school has a program called the Summer Research Fellowship that is available to P1s and P2s interested in conducting research. The student is able to pick a faculty mentor of their choice (that is willing to participate), so the student is able to choose a faculty member involved in planetary health and/or sustainable healthcare if they so choose.</i></p>	

2. Does the pharmacy school provide access for students to specific information related to planetary health and/or sustainable healthcare activities and mentors within the school? For example, a web page detailing projects achieved, current initiatives underway at the pharmacy school and/or contact information for potential mentors.

2	The pharmacy school provides 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	The pharmacy school provides some information on projects and mentors within planetary health and sustainable healthcare within the school, but it lacks key information.
0	There is no pharmacy school specific access to planetary health and/or sustainable healthcare projects or mentors.

Score explanation: There is no pharmacy school specific access to planetary health and/or sustainable healthcare projects or mentors.

3. Does your University have registered student groups dedicated to fostering a culture of planetary health engagement, scholarship, and advocacy on campus, supported by faculty advisors?

2	Yes, there is a student organisation with faculty support at my University dedicated to planetary health or sustainability in healthcare.
1	Yes, there is a student organisation at my University dedicated to planetary health or sustainability in healthcare but it lacks faculty support.
0	No, there is not a student organisation at my institution dedicated to planetary health or sustainability in healthcare.

Score explanation: The Sustainable Pharmacy Project is a student-created organization, focused on reducing the impact of pharmaceuticals on the environment through various efforts. Currently, our faculty advisor is Dr. Joe DiPiro, who is involved in the completion of this report card.

4. In the past year, has the institution had one or more extra-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 organise hiking, backpacking, kayaking, or other outings for students)

Score explanation: All points given are for programs that are institutional wide across both the undergraduate campus and graduate/medical campus of VCU. Pharmacy students have access to both campus; although, knowledge about events related to planetary health aren't advertised.

Section Total (8 out of 12)	67%
------------------------------------	------------

Campus Sustainability

Section Overview: *This section evaluates the support and engagement in sustainability initiatives by the pharmacy 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 endeavour, the healthcare sector is well poised to lead the world to a more sustainable future. This will involve scrutinising 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 pharmacy schools and institutions must set the standard for sustainable practices, and show other sectors what is possible when it comes to minimising environmental impact.*

1. Does your University 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 pharmacy 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 pharmacy.
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: VCU has recently put together a development committee in charge of the “ONE VCU Sustainability Plan”. This committee includes faculty and staff from VCU, the VCU health system, VCU’s director of sustainability, an undergraduate student representative, and a medical school student representative. This plan aims to increase our schools sustainability, and will roll out in phases in the next 12-18 months. However, there is no representative from the School of Pharmacy on this committee.</i></p>	

2. How ambitious is your pharmacy 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 pharmacy school 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 school 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 pharmacy 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 recently started the [ONE VCU Sustainability Plan](#), which is a multidisciplinary effort across the undergraduate and graduate campuses to develop a plan in the next 12-18 months to improve sustainability through the university and health system. Currently the initiative has recruited a committee and partnered with a third party consulting group to begin carbon planning.

According to their mission, LEED certified buildings are “proven to save money, improve efficiency, lower carbon emissions and create healthier places for people.” They provide sustainability to buildings in and around Richmond. The categories they cover are sustainable sites, water efficiency, the energy and atmosphere of the building, material and resources, indoor environmental quality, and innovation. Based on these categories and their allocated concepts, VCU School of Pharmacy scored a 27/57 and were awarded a “Silver” LEED designation in 2011. Stronger areas included sustainable sites and water efficiency, while the SOP performed poorly specifically with indoor environmental quality and energy & atmosphere.

3. Does your pharmacy school have an organics recycling program (compost) and a conventional recycling program (aluminium/paper/plastic/glass)?

2	Yes, the pharmacy school has both compost and recycling programs accessible to students and faculty.
1	The pharmacy 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 pharmacy school.
<p><i>Score explanation: Recycling is available to students, but we are not sure if recycling is adopted correctly.</i></p>	

4. Does your pharmacy school provide paperless teaching? e.g. lecture materials, exam papers, hand-outs	
3	The whole course is delivered using online modalities of assignment, lecture, and examination delivery.
2	The majority of the course is delivered using online modalities with exception to few assignments where paper is still encouraged.
1	Some of the course is delivered using online modalities, but the majority of assignments and examinations are on paper.
0	None of the coursework is delivered using online modalities and paper printing is widespread.
<p><i>Score explanation: Most coursework is turned in online, and most exams are taken through ExamSoft, an online exam proctoring program. However some professors occasionally do require assignments to be printed out and handed in, especially in lab courses. Some exams that require drawing of chemical structures are also given on paper.</i></p>	

5. Does your pharmacy school have programs and initiatives to assist with making lab spaces more environmentally sustainable?	
2	Yes, the 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 school to make lab spaces more sustainable.
<p><i>Score explanation: Unofficial efforts to make lab spaces for experiential learning more environmentally sustainable are led by Dr. Caldas, the course coordinator for the Foundations I laboratory course. Efforts include medication reuse and potential medication redistribution. This initiative is not supported by the SoP.</i></p>	

6. Does your institution have a strategy or timeline for divestment from fossil fuels?	
4	The institution has fully divested from fossil fuels
3	Yes, the institution has solid divestment plans and a set timeline in which to divest by
2	The institution has committed to divestment but does not have a set strategy or timeline
1	The institution has mentioned divestment but doesn't have a strategy or timeline
0	No, there are no plans nor mention of divestment from fossil fuels
<p><i>To this end, members of the VCU Sustainability Advisory Group—Mark Wood, School of World Studies; Beth Kreydatus, Department of Focused Inquiry; Michael Donnenberg, School of Medicine; and Bill Muth, School of Education (emeritus)—fashioned a DECLARATION OF CLIMATE EMERGENCY<https://docs.google.com/document/d/1XD9ZF8jyNNWM2UK_-hubXsQOFrIVqK4gTO0gW1x8TIQ/edit?usp=sharing>, based on an earlier declaration that the City of Richmond<https://richmondmagazine.com/news/news/climate-emergency-declaration/> unanimously approved, which was authored by Barry O'Keefe, VCUArts. The Faculty Senate has agreed to disseminate the declaration and encourage discussions among all VCU faculty members through their regularly scheduled meetings, in advance of a Faculty Senate vote to support the declaration in January.</i></p>	

Section Total (7 out of 18)	39%
------------------------------------	------------

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 Virginia Commonwealth University School of Pharmacy

The following table presents the individual section grades and overall institutional grade for the Virginia Commonwealth University on this pharmacy-school-specific Planetary Health Report Card.

Section	Raw Score	Letter Grade
Planetary Health Curriculum (59%)	$(16/66) \times 100 = 24\%$	D-
Interdisciplinary Research (9%)	$(5/10) \times 100 = 50\%$	C
Community Outreach and Advocacy (5%)	$(1/6) \times 100 = 17\%$	F+
Support for Student-led Planetary Health Initiatives (11%)	$(8/12) \times 100 = 67\%$	B
Campus Sustainability (16%)	$(7/18) \times 100 = 39\%$	D+
Institutional Grade	$(A \times 0.59 + B \times 0.09 + C \times 0.05 + D \times 0.11 + E \times 0.16) = 34\%$	D+

References

1. PLANETARY HEALTH - Planetary Health Alliance [Internet]. Planetary Health Alliance. 2022 [cited 24 February 2022]. Available from: <https://www.planetaryhealthalliance.org/planetary-health>
2. Climate change and health [Internet]. Who.int. 2021 [cited 24 February 2022]. Available from: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
3. Lenzen M, Malik A, Li M, Fry J, Weisz H, Pichler PP, Chaves LS, Capon A, Pencheon D. The environmental footprint of health care: a global assessment. *The Lancet Planetary Health*. 2020 Jul 1;4(7):e271-9.
4. Patel M, Kumar R, Kishor K, Mlsna T, Pittman Jr CU, Mohan D. Pharmaceuticals of emerging concern in aquatic systems: chemistry, occurrence, effects, and removal methods. *Chemical reviews*. 2019 Mar 4;119(6):3510-673.
5. National Institute for Health and Care Excellence, NICE encourages use of greener asthma inhalers [Internet]. NICE. 2019 [cited 24 February 2022]. Available from: <https://www.nice.org.uk/news/article/nice-encourages-use-of-greener-asthma-inhalers#:~:text=Metered%20dose%20inhalers%20have%20estimated,compared%20to%2020g%20in%20DPIs>.
6. Urgent health challenges for the next decade. World Health Organization. 2020.[cited 24 February 2022]. Available from: <https://www.who.int/news-room/photo-story/photo-story-detail/urgent-health-challenges-for-the-next-decade>
7. Thomas K, Hardy RD, Lazrus H, Mendez M, Orlove B, Rivera-Collazo I, Roberts JT, Rockman M, Warner BP, Winthrop R. Explaining differential vulnerability to climate change: A social science review. *Wiley Interdisciplinary Reviews: Climate Change*. 2019 Mar;10(2):e565.
8. Shaw E, Walpole S, McLean M, Alvarez-Nieto C, Barna S, Bazin K, Behrens G, Chase H, Duane B, El Omrani O, Elf M. AMEE consensus statement: planetary health and education for sustainable healthcare. *Medical teacher*. 2021 Mar 4;43(3):272-86.