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# **Planetary Health Report**

## **Card: Pharmacy**

*University of Charleston School of  
Pharmacy*

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## 2022 Contributing Team:

- Students: Ashley Lam, George Chalil, Maryheather Walsh
- Faculty Mentors: Dr. Alice Gahbauer
- \*Primary Contact: Ashley Lam, [ashleylam@ucwv.edu](mailto:ashleylam@ucwv.edu)

## Statement of Purpose

### *Planetary health is human health.*

The Planetary Health Alliance describes planetary health as, “a solutions-oriented, transdisciplinary field and social movement focused on analyzing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth”[1]. This definition is intentionally broad, intended to encompass the multitude of ways 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 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 practice account for around 8% of the total global greenhouse gas footprint of healthcare[3]. Pharmaceutical waste also provides a dangerous contaminant to our water systems [4]. Metered dose inhalers contribute 500g CO<sub>2</sub>eq 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. We must encourage them to generate research to better understand health impacts and solutions, support related student initiatives, embrace sustainable practices as much as possible, and engage 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.” A health professional is, “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”. Education is, “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, which exist as a product of the cares or needs of the community that surrounds the university. 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.

## Summary of Findings

<b>Overall</b>	C
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<b>Curriculum</b>	C
<ul style="list-style-type: none"> <li>• One lecture available in one core course for first-year students comprehensively addresses various planetary health topics. Some planetary health considerations are mentioned very briefly in other lectures for other core and elective courses, but these discussions are mostly limited to just one bullet point or one slide in one lecture in the course.</li> <li>• The UCSOP curriculum could be improved with respect to planetary health education by ensuring that these topics are covered in more courses and woven throughout courses offered across all three didactic years.</li> </ul>	
<b>Planetary Health Research</b>	B-
<ul style="list-style-type: none"> <li>• The UCSOP has one faculty member whose research areas of interest include planetary health education and healthcare sustainability. The research that this individual has done has contributed to the development of this Planetary Health Report Card for Pharmacy initiative, as well as the integration of planetary health topics into the UCSOP curriculum.</li> <li>• The planetary health research conducted by members of the UCSOP would benefit from the creation of a process by which individuals more vulnerable to the effects of climate change and environmental injustice give input on the research agenda at the SOP.</li> </ul>	
<b>Community Outreach and Advocacy</b>	C
<ul style="list-style-type: none"> <li>• Partnerships with local community organizations are highly commended.</li> <li>• Developing regular communication regarding planetary health issues and enrolling in a planetary health organization would be beneficial.</li> </ul>	
<b>Support for Student-Led Initiatives</b>	B
<ul style="list-style-type: none"> <li>• Faculty support for student-led initiatives is abundant in terms of sustainable healthcare research and the creation and implementation of environmentally focused activities, such as hiking.</li> <li>• The development of an environmental or public health track at the UCSOP might help students more easily propose and partake in planetary health or sustainable healthcare research. The development of a website to keep the community aware of sustainability projects, current initiatives, and planetary health news would be an easy way to inspire individuals to join the movement.</li> </ul>	
<b>Campus Sustainability</b>	D
<ul style="list-style-type: none"> <li>• While UC does have a recycling program, campus sustainability could be increased through the creation of an Office of Sustainability, formal plans to reduce its own carbon footprint, and/or plans to make labs more environmentally sustainable.</li> </ul>	

# 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.

<b>1. Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?</b>	
3	This topic is explored in depth by the core curriculum.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

***Score explanation:***

*In one core course, PHAR555 Strategies for Positive Health Outcomes, there is one comprehensive lecture, “Pharmacists and the Environment,” taught by Alice Gahbauer, PharmD, BCACP.*

- *Across several slides, a figure from the CDC (“Impact of Climate Change on Human Health”) is displayed, showing that “more extreme weather” affects air pollution and changes in vector ecology, which, in turn, affect human health through increases in the prevalence of asthma, cardiovascular disease, malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme Disease, chikungunya, and West Nile virus.*
- *“Extreme weather” is described as a factor that affects human health directly. Extreme weather is defined, its effects on human health are listed, and populations most vulnerable to extreme weather are summarized.*
- *Extreme weather events are also discussed as a contributing factor to mental health problems, such as stress, depression, anxiety, PTSD, and suicidal thoughts.*

<b>2. Does your pharmacy school curriculum address the environmental impact of medicines in terms of their pollution, ecological impact and contamination of water systems?</b>	
3	This topic is explored in depth by the core curriculum.

2	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*The “Pharmacists and the Environment” lecture in the PHAR555 Strategies for Positive Health Outcomes core course discusses the presence of pharmaceuticals in waterways, U.S. Environmental Protection Agency’s (EPA) “Contaminant Candidate List” which lists chemicals from pharmaceuticals as unregulated contaminants, sources from which pharmaceuticals enter the water, and discussion of whether the presence of pharmaceuticals in the water poses a threat to health.*

*Two other lectures, “Patterns of Disease / Environmental Health Influences” and “Water Pollution” taught by Frank Annie, M.A., MPA, PhD, are available through the PHAR555 Strategies for Positive Health Outcomes course. In these, Dr. Annie educates about the importance of ecology in the context of healthcare. He educates more about water pollution, specific contaminants, methods of purifying water, and how water pollution can negatively impact human health. Specifically, he discusses how water pollution is linked to liver and stomach cancer in China and lists organic solvents as one of many “common pollutants” in ground water, which already cannot cleanse itself very well. Although the impact of medicines on water pollution is not clearly explained in this lecture series, it is useful to have this framework to better understand the importance of maintaining clean and healthy waterways.*

*In the PHAR740 Pharmacotherapy III core course, environmental considerations relating to oncology drugs were presented by a student in a series called the Envirominute. The Envirominute is designed to be a short supplement explaining the environmental implications of the drugs or drug classes discussed during the lecture.*

**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	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*This topic is briefly addressed in the “Pharmacists and the Environment” lecture in the PHAR555 Strategies for Positive Health Outcomes core course. Environmentally friendly interventions that could be made at the “research and development” and “manufacturing” stages of the medication life cycle (from development to prescribing to disposal) are listed.*

**4. Does your pharmacy school curriculum address the carbon footprint of healthcare systems?**

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

Score explanation:

*In the “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course mentioned in questions 1-3, two slides describe the impact of the healthcare sector on the overall U.S. carbon footprint.*

**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.
<b>2</b>	<b>These topics are briefly covered in the core curriculum.</b>
1	These topics are covered in elective coursework.
0	These topics are not covered.

Score explanation:

*In the “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course, a figure from the CDC mentions how “changes in vector ecology,” “water quality impacts,” and “water and food supply impacts” impact the occurrence of infectious diseases such as malaria, cholera, Lyme Disease, and more. Later in the lecture, concern for antimicrobial resistance is listed as a possible effect of the presence of pharmaceuticals in the water.*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*In the PHAR522 Pharmaceutics II core course, one lecture entitled, “Aerosols, Inhalations, and Sprays,” presents the “effect on ozone” and “greenhouse effect” as differentiating factors between hydrocarbon propellants, chlorofluorocarbons, hydrofluorocarbons, and hydrofluoroalkanes found in inhalers.*

*The “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course shows a connection between climate change and an increase in incidence of respiratory allergies and asthma through increasing allergens.*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*In the “Pharmacists and the Environment” lecture from the PHAR555 Strategies to Positive Health Outcomes core course, a figure from the CDC draws a connection between extreme heat and heat-related illness and/or death, and cardiovascular failure. Extreme heat is also discussed in detail across several slides. Extreme heat is defined, its health implications are listed, and populations more vulnerable to its effects are discussed.*



**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*In the “Part 1: Allergy, Hypersensitivities (focusing on Type 1), and Allergic Rhinitis” lecture from the PHAR512 Immunology core course, one slide discusses air pollution as a factor that makes individuals more susceptible to allergies.*

*In the “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course, a figure from the CDC shows the relationship between climate change and an increase in the prevalence of respiratory allergies through increasing allergens. Later, air pollution is discussed as an effect of climate change that affects health directly through the increased incidence of allergy attacks. Populations more vulnerable to this change are listed.*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*In the “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course, a figure from the CDC describes the impact of climate change on mental health through severe weather and environmental degradation. Mental health problems, such as stress, depression, anxiety, and PTSD, are also described in more detail as an effect of increased frequency and severity of extreme weather events. Populations most vulnerable to these effects are also listed.*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic was not covered.

Score explanation:

*The “Pharmacists and the Environment” lecture presented in the PHAR555 Strategies for Positive Health Outcomes identifies groups more vulnerable to the effects of climate change, such as POC, low socioeconomic status, children, elderly, and disabled, as well as factors that can contribute to individuals’ sensitivity to environmental impacts.*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

Score explanation:

*This idea is mentioned on one slide in a lecture entitled, “Social Determinants of Health,” presented in the PHAR555 Strategies for Positive Health Outcomes core course.*

*It is also alluded to in the “Pharmacists and the Environment” lecture in the same course, when the CDC figure connects climate change and malnutrition via impacts on water and food supply.*

**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.
<b>0</b>	<b>This topic was not covered.</b>
<i>Score explanation:</i>	

**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.
<b>1</b>	<b>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).</b>
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**

*Please highlight all metrics that apply to your pharmacy school and insert explanations below.*

Score explanation:

*The “Pharmacists and the Environment” lecture presented in the PHAR555 Strategies for Positive Health Outcomes core course explains the FDA recommendation for drug disposal, which advises patients to dispose of their drugs at a drug take-back location or refer to the FDA flush list to determine which medications can be flushed. One slide summarizes drugs on the FDA flush list, and instructs pharmacists to educate patients to refer to drug packaging when the FDA flush list is not readily available.*

*The same lecture also mentions benign-by-design methods for greener drug research and development, but it does not explore this topic in depth.*

**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:

*As mentioned in question 6, the “Aerosols, Inhalations, and Sprays” lecture in the PHAR522 Pharmaceuticals II core course presents the “effect on ozone” and “greenhouse effect” as differentiating factors between hydrocarbon propellants, chlorofluorocarbons, hydrofluorocarbons, and hydrofluoroalkanes.*

**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.
<b>0</b>	<b>No, there are not strategies or examples for having conversations with patients about climate change</b>
<i>Score explanation:</i>	

<b>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?</b>	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
<b>1</b>	<b>This topic is covered in elective coursework.</b>
0	This topic is not covered.
<i>Score explanation:</i> <p><i>This idea is mentioned in a lecture entitled “Environmental Barriers to Health,” offered in the PHAR536 Barriers to Health elective course. It explains that environmental impact should be considered as a factor when choosing between two therapeutically safe and effective medications. It also teaches about Janusinfo, the Swedish database listing the environmental impact of various drugs, and The Wise List, the formulary/guideline resource used in Stockholm for guidance of therapeutic management of common disease states. It mentions them as references available in other countries that can be used to make this comparison. However, no specific strategies nor resources are provided for pharmacy students to begin implementing this in practice. This is likely due to the fact that there is no similar American database or guidance documents.</i></p>	

**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:*

*Student and faculty champions are currently developing a series of short lectures meant to directly connect Pharmacotherapy topics with environmental sustainability pearls. This series will be called the "Envirominute." These champions are also developing course material focused on sustainability!*

**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 is/are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum as well as doing their principal role.**

0 There are no members of faculty who are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum

*Score explanation:*

*Alice Gahbauer, PharmD, BCACP, is an assistant professor at the UCSOP. Dr. Gahbauer has been working diligently to incorporate environmental sustainability topics into the UCSOP curriculum, and inspires students to research, develop initiatives, and ultimately progress the planetary health field. She does this in addition to her various faculty and clinic responsibilities.*

**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.
<b>0</b>	<b>No, there are no such clinical practice experiences/placements available through the pharmacy school.</b>

*Score explanation:*

**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.
<b>2</b>	<b>This topic is briefly covered in the core curriculum.</b>
1	This topic is covered in elective coursework.
0	This topic is not covered.

*Score explanation:*

*The “Pharmacists and the Environment” lecture from the PHAR555 Strategies for Positive Health Outcomes core course acknowledges groups more vulnerable to the effects of climate change. These include POC, individuals of low socioeconomic status, children, elderly, and disabled.*

<b>Section Total (33 out of 66)</b>	<b>50.00%</b>
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*Are there additional curriculum resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.*



# Planetary Health Research

***Section Overview:*** *This section evaluates the quality and quantity of planetary health research at the school and within 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.*

<b>1. Are there researchers engaged in planetary health research and healthcare sustainability research at your pharmacy school?</b>	
3	Yes, there are faculty members at the School of Pharmacy who have a primary research focus in planetary health or healthcare sustainability.
<b>2</b>	<b>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.</b>
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:</i>  <i>Alice Gahbauer, PharmD, BCACP is an assistant professor at the UCSOP who conducts research related to planetary health and healthcare sustainability. However, this is not her only research area of interest.</i></p>	

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

*In the past year, the UCSOP has hosted two planetary-health-focused events. One involved a Sustainability Panel. Some pharmacy faculty and students were featured as panellists during this event, and it was broadcasted on campus. All students were invited to attend. The second event, called the “Plant a Seed” event, was hosted by a student. Attendees were given pots to decorate and tulips to plant inside them. Meanwhile, a student gave a lecture about environmental sustainability.*

*The university’s annual Enlightened Day of Living Event included an environmental panel with speakers from the West Virginia Environmental Council, Moms Clear Air Force, and the WV Rivers Coalition. The recording can be found here: [https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WkaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&\\_xzm\\_rtaid=OaOIhYTgOb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&\\_xzm\\_rhtaid=463](https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WkaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&_xzm_rtaid=OaOIhYTgOb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&_xzm_rhtaid=463)*

**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	<b>There is no process, and no efforts to create such a process.</b>

Score explanation:

<b>Section Total (6 out of 10)</b>	<b>60%</b>
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*Are there additional research resources offered at your 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 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 organisations to promote planetary and environmental health?**

**3 Yes, the pharmacy school partners with multiple community organisations to promote planetary and environmental health to share opportunities for student involvement.**

2 Yes, the pharmacy school partners with one community organisation to promote planetary and environmental health to share opportunities for student involvement.

1 The institution partners with community organisations, but the pharmacy school is not part of that partnership.

0 No, there is no such meaningful community partnership.

***Score explanation:***

*The University of Charleston’s annual Enlightened Day of Living Event included an environmental panel with speakers from the West Virginia Environmental Council, Moms Clear Air Force, and the WV Rivers Coalition. At the end of the session, the organizations invited attendees to become “water quality monitors.” The recording can be found here: [https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WKaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&\\_x\\_zm\\_rtaid=OaOIhYTgQb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&\\_x\\_zm\\_rhtaid=463](https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WKaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&_x_zm_rtaid=OaOIhYTgQb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&_x_zm_rhtaid=463)*

*The UCSOP participates in the annual UC Labor of Love event. In 2019, one activity involved sending 27 pharmacy students, faculty, and staff members to clean up the Haddad River Front Park. In other years, these events have included multiple park and neighborhood clean-up projects. These have required collaboration with park authorities, officials in Charleston, Beckley, and Alum Creek, WV, and groups like Lions Club.*

*Pharmacy students on the Geriatric Track gave a presentation to participants (adults aged 65 and older) at the Hansford Senior Center in St. Albans, WV about medication safety and proper disposal of medications. Students also distributed Deterra Medication Disposal packets at this event.*

**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.            |
| <b>0</b> | <b>Students do not regularly receive communications about planetary health or sustainable healthcare.</b>              |

Score explanation:

**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 |
| <b>0</b> | <b>No, the school is not a member of such an organisation</b>                                   |

Score explanation:

*The pharmacy school is not an official member of an ESH organization (e.g. Practice Greenhealth or Health Care Without Harm).*

<b>Section Total (3 out of 6)</b>	<b>50%</b>
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*Are there additional community engagement and advocacy resources offered at your pharmacy 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 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.

*Score explanation:*

*The opportunity to conduct research in this field is available to UCSOP students, however the onus is on the student to seek these opportunities out and complete them in their spare time.*

**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.
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*Score explanation:*  
 Alice Gahbauer, PharmD, BCACP is known on campus as a potential mentor for students interested in planetary health. However, a webpage detailing information about sustainability projects underway at the UCOSOP specifically does not yet exist.

**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	<b>Yes, there is a student organisation with faculty support at my University dedicated to planetary health or sustainability in healthcare.</b>
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:*  
 RxforClimate is an organization dedicated to planetary health and healthcare sustainability that is open to both pharmacy students and pharmacists alike. It is not limited to membership at the UCSOP, but it does have faculty support.

**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	<b>Panels, speaker series, or similar events related to planetary health that have students as an intended audience.</b>



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

Score explanation:

*As mentioned in question 2 from the Planetary Health Research section, in the past year, the UCSOP has hosted two planetary-health-focused events. One involved a Sustainability Panel. Some pharmacy faculty and students were featured as panellists during this event, and it was broadcasted on campus. All students were invited to attend. The second event, called the “Plant a Seed” event, was hosted by a student. Attendees were given pots to decorate and tulips to plant inside them. Meanwhile, a student gave a lecture about environmental sustainability.*

*The university’s annual Enlightened Day of Living Event included an environmental panel with speakers from the West Virginia Environmental Council, Moms Clear Air Force, and the WV Rivers Coalition. The recording can be found here: [https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WkaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&\\_x\\_zm\\_rtaid=OaOIhYTgOb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&\\_x\\_zm\\_rhtaid=463](https://zoom.us/rec/play/qdp-uZnBXh7ckp0whNSeI7WkaVTYuitwz6SYWGVCM1hDqdRATgEQYdPVOaR1bZmt6LaZXXeaS7B-ajad.CvuM-97YdwWNzBkD?continueMode=true&_x_zm_rtaid=OaOIhYTgOb2nQ0Rh9qDUAw.1649774329264.93a2950e59786129fba9cd57503f79ac&_x_zm_rhtaid=463).*

*Hiking is a beloved pastime among UCSOP students and faculty. Earlier this month, two professors organized a hike and invited any interested pharmacy students to attend. In an Ethnopharmacology elective offered to first year students, Rebecca Linger plans an outdoor picnic and subsequent hike as a “finale” to the semester.*

<b>Section Total (8 out of 12)</b>	<b>66.67%</b>
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*Are there additional student-led initiative resources offered at your 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 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.*

<b>1. Does your University have an Office of Sustainability?</b>	
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
<b>0</b>	<b>There are no staff members or task force responsible for overseeing campus sustainability</b>
<i>Score explanation:</i>	

<b>2. How ambitious is your pharmacy school/institution’s plan to reduce its own carbon footprint?</b>	
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	<b>There is a CO2 emission reduction goal, but it is not one of carbon neutrality.</b>
0	There is no stated goal for reduction of CO2 emissions.
<p><u>Score explanation:</u>  <i>Although no formal policy has been published, the University of Charleston does employ “pro-environment” individuals who state, “our goal is to be a campus that is more sustainable.” One such individual is Gary Boyd, the Director of Facilities and Services at the University of Charleston. Boyd was responsive to suggestions relating to sustainability, including increasing the number of recycling bins available in the SOP and facilitated in switching to eco-friendly carryout boxes in the UC dining hall. He also reports installing several LED bulbs to reduce electric consumption across the UC campus and refurbishing the student union building air handling units to include energy efficient motors.</i></p>	

<b>3. Does your pharmacy school have an organics recycling program (compost) and a conventional recycling program (aluminium/paper/plastic/glass)?</b>	
2	Yes, the pharmacy school has both compost and recycling programs accessible to students and faculty.
1	<b>The pharmacy school has either recycling or compost programs accessible to students and faculty, but not both.</b>
0	There is no compost or recycling program at the pharmacy school.
<p><u>Score explanation:</u>  <i>The University of Charleston has a recycling program accessible to students, faculty, and staff. Per a recycling tonnage report provided by Gary Boyd, the University of Charleston recycled over 9 tons of material, including scrap metals, equipment batteries, lightbulbs, and scrap wood. However, there is no compost program on campus.</i></p>	

<b>4. Does your pharmacy school provide paperless teaching? e.g. lecture materials, exam papers, hand-outs</b>	
3	The whole course is delivered using online modalities of assignment, lecture, and examination delivery.
2	<b>The majority of the course is delivered using online modalities with exception to few assignments where paper is still encouraged.</b>

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:</i>  <i>Electronic lecture materials are disseminated online through eLearn. In-class learning assignments, SOAP (patient case) notes, research papers, etc. are submitted via online portals on eLearn. Online poll sites, such as Pollev and TopHat are utilized to ensure student participation. Quizzes and exams are administered electronically, through Exemplify. The exception to this is the scrap paper often requested for use during exams. The only courses that require paper submission are math-based courses, including PHAR514 Pharmaceutics I, PHAR522 Pharmaceutics II, and PHAR610 Pharmacokinetic Principles.</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	<b>There are no efforts at the school to make lab spaces more sustainable.</b>

*Score explanation:*

<b>Section Total (4 out of 14)</b>	<b>28.6%</b>
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*Are there additional sustainability resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.*

# Grading

## Section Overview

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

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

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

## Planetary Health Grades for the University of Charleston School of Pharmacy

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

Section	Raw Score	Letter Grade
<b>Planetary Health Curriculum (30%)</b>	$(33 / 66) \times 100 = 50.00\%$	C
<b>Planetary Health Research (17.5%)</b>	$(6 / 10) \times 100 = 60\%$	B-
<b>Community Outreach and Advocacy (17.5%)</b>	$(3 / 6) \times 100 = 50\%$	C
<b>Support for Student-led Planetary Health Initiatives (17.5%)</b>	$(8 / 12) \times 100 = 66.67\%$	B
<b>Campus Sustainability (17.5%)</b>	$(4 / 14) \times 100 = 28.6\%$	D
<b>Institutional Grade</b>	$(50 \times 0.3 + 60 \times 0.175 + 50 \times 0.175 + 50 \times 0.175 + 28.6 \times 0.175) =$ <b>50.9 %</b>	C

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