

PLANETARY HEALTH REPORT CARD

APRIL 2024

PHARMACY

2023-2024 SUMMARY REPORT

Prepared by:

Pharmacy students and faculty from 10 pharmacy schools in 5 countries

With Support from:

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Global Consortium on Climate and Health Education

Medical Students for a Sustainable Future

Planetary Health Alliance

UK Health Alliance on Climate Change



phreportcard.org/pharmacy

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1. ABOUT THE INITIATIVE

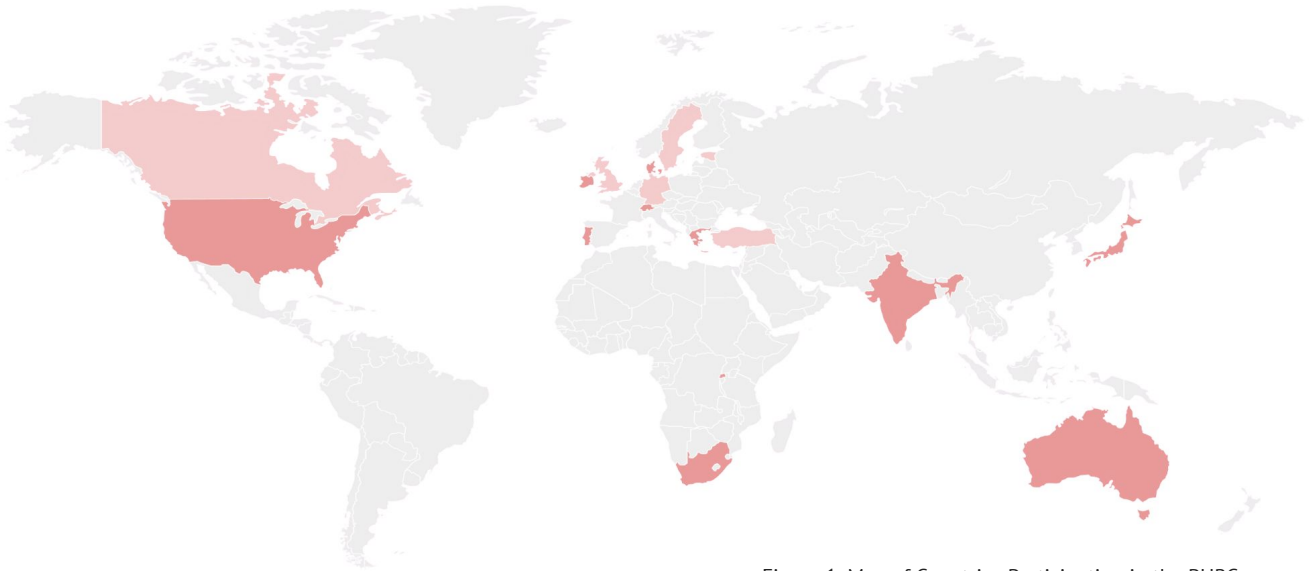


Figure 1: Map of Countries Participating in the PHRC

“**Planetary Health** is 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⁾

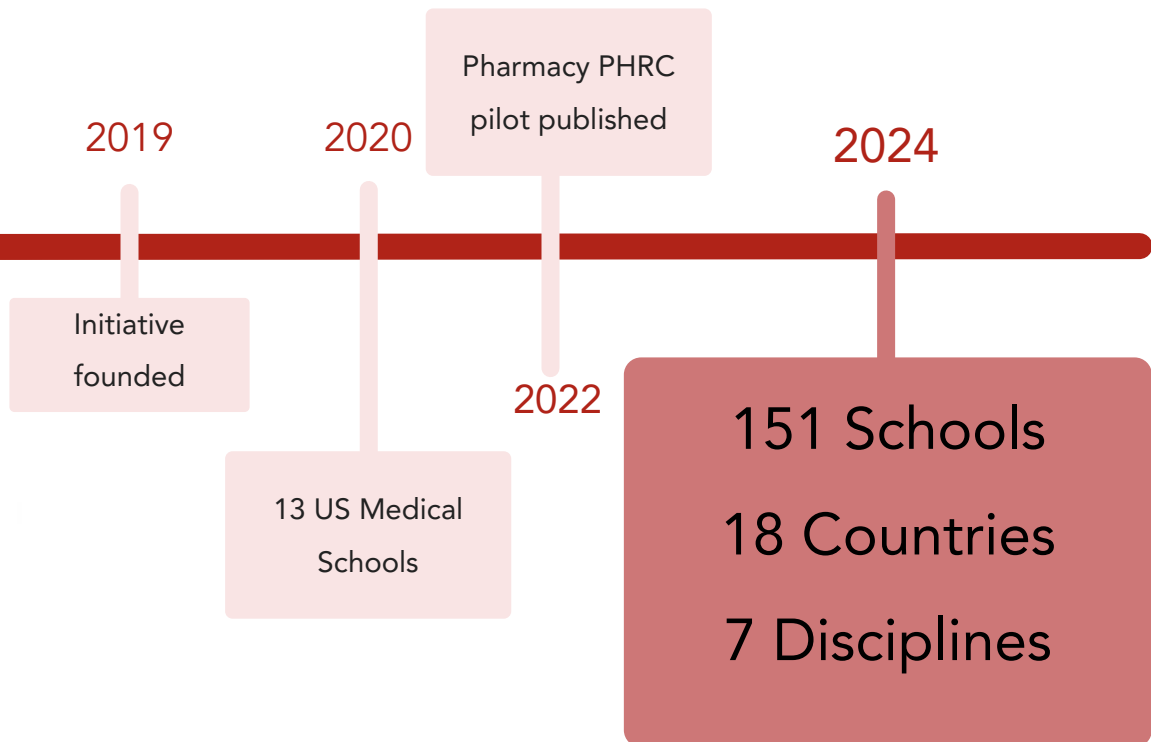
As future health professionals, we must be prepared to address the impacts of human-caused environmental changes on our patients’ health, and to understand and mitigate the environmental impact of clinical care. It is imperative that we hold our institutions accountable for educating health students on planetary health and education for sustainable healthcare, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices on our campuses and in our hospitals, and engaging with surrounding communities that are most affected by environmental threats. Because climate change and environmental threats disproportionately affect marginalized populations, these issues are inherently ones of equity and justice.

With the purpose of increasing planetary health awareness and accountability among medical schools, the Planetary Health Report Card (PHRC) was developed as an institutional advocacy tool in 2019 by a group of medical students at the University of California, San Francisco School of Medicine.


The PHRC is a student-driven metric-based tool that aims to evaluate health professional schools on discrete metrics in five main category areas:

- 1) Curriculum
- 2) Planetary health research
- 3) Community outreach and advocacy
- 4) Support for student-led initiatives
- 5) Campus sustainability.

Since its founding just five years ago, the PHRC community has grown to encompass 18 countries and over 151 health professional schools. As it has spread across the world, it has left many examples of institutional change in its wake. Though initially developed by medical students to evaluate medical schools, the report card has been adapted for dentistry, nursing, occupational therapy, pharmacy, and physiotherapy training programs, catalyzing interprofessional collaboration.



2. GOALS

- ❖ Assess the current level of planetary health and sustainability consideration and inclusion within pharmacy school education and wider institutions, using the metrics as a 'needs assessment' tool.
 - ❖ Measure improvements in planetary health and sustainability intra-institutionally each year.
 - ❖ Encourage examples of planetary health and sustainability engagement and highlight opportunities for growth.
 - ❖ Progress the global planetary health movement.
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3. SECTIONS OF THE REPORT CARD

Planetary Health Curriculum



This section evaluates the integration of planetary health topics into the pharmacy school curriculum. Pharmacists will be on the frontlines of tackling and treating the health effects of climate and other environmental changes. Therefore, it is critical that pharmacy students understand planetary health issues and learn how to practice sustainably and reduce the environmental impact of medicines and devices.

Planetary Health Research



This section evaluates the quality and quantity of planetary health research at the pharmacy school and with the wider institution. Planetary health is an emerging field. To facilitate appropriate teaching on planetary health, pharmacy schools should support research in areas such as the health effects of climate change, adaptive measures and pharmacy's environmental impact.

Community Outreach and Advocacy



This section evaluates pharmacy school engagement in community outreach and advocacy efforts associated with planetary health. Climate change disproportionately impacts under-resourced populations and communities of colour, therefore, it is critical that pharmacy schools and their institutions directly engage with communities most affected by environmental health harms and provide opportunities for student involvement.

3. SECTIONS OF THE REPORT CARD

Support for Student-Led Planetary Health Initiatives



This section evaluates institutional support for student-led planetary health initiatives such as quality improvement and information sharing. Students are the future of the work force and shape the future of the pharmacy profession therefore, it is vital they are supported in engagement with emerging fields in healthcare such as planetary health.

Campus Sustainability



This section evaluates the support and engagement in sustainability by the pharmacy school and/or institution, considering aspects including carbon footprint and waste management. Our pharmacy schools and institutions must set the standard for sustainable practices and minimising environmental impact.



2024 PHRC RESULTS PHARMACY

(Click the school name to read their full report)

		Overall	Planetary Health Curriculum	Interdisciplinary Research	Community Outreach & Advocacy	Support for Student-led Initiatives	Campus Sustainability
1.	University of Montana (US)	B+	A-	A	B	A-	C-
2.	Monash University (Australia)	B	C	A-	B	A-	A
3.	University of California, San Francisco (US)	C+	B-	B-	F+	C-	B
4.	University College London (UK)	C+	C+	C	C	B	B
5.	Keele University (UK)	C+	C+	D	D	B	B
6.	Queen's University Belfast (UK)	C	C-	C	D	A	B
7.	University of Auckland (New Zealand)	C	D	B-	D	C-	B+
8.	University of Colorado Anschutz (US)	D+	D-	B-	D	C+	B
9.	Hacettepe University (Türkiye)	D+	D	B-	F-	D	C
10.	Virginia Commonwealth University (US)	D	D-	C	F+	C	C

80-100% = A, 60-79% = B, 40-59% = C, 20-39% = D, 0-19% = F

Scores within top or bottom 5% awarded + or -, respectively

= Overall score improved

Each section of the metrics contains a different number of questions. Therefore, the overall grade is calculated taking this into account.

- Curriculum = 59%
- Research = 9%
- Community outreach and advocacy = 5%
- Student-led initiatives = 11%
- Campus sustainability = 16%

5. RECOMMENDATIONS

1. DIVEST FROM FOSSIL FUELS

Research has shown that air pollution, resulting from burning fossil fuels, is responsible for around 1 in 5 deaths globally⁽²⁾. This staggering statistic highlights the danger to public health associated with fossil fuels. It is a complete contradiction for our institutions and healthcare educators to fund this. It is vital that institutions move their investment portfolios away from fossil fuels.

Examples:

University College London, University of California, San Francisco, Keele University and University of Auckland have fully divested from fossil fuels.

Queen's University Belfast and Monash University, have developed plans that are underway to full divest from fossil fuels by 2025 and 2030, respectively.

2. INCLUDE TEACHING ON DISASTER PREPAREDNESS IN THE CURRICULUM

Our planet is unequivocally in crisis. We, as pharmacy professionals, must be equipped to provide care to our patients in the face of extreme weather events and natural disasters resulting from climate change. Therefore, it is imperative that we are made aware of such risks to global health and provided with the knowledge to adequately care for ourselves and our patients through these events as part of the core curriculum.

Examples:

University of Montana's core curriculum classes and electives incorporate the issues that extreme weather has on health and access to medications during extreme cold, heat, smoke, and floods.

Keele University holds interprofessional education days where the health professionals learn how to maintain delivery of healthcare services in the event of flash flooding.

Hacettepe University discusses the impact of climate change on increasing natural disasters in their core curriculum class 'Disaster Toxicology and Physical, Chemical and Biological Factors Causing Disasters'. This emphasises the increase in social inequalities which disasters exacerbates and the impact on accessibility of health services, clean water and food.

3. INCORPORATE THE IMPACT OF PHARMACEUTICALS ON THE ENVIRONMENT AND CLIMATE CHANGE IN CLINICAL TEACHING

Pharmaceuticals exert a significant environmental footprint and play a role in climate change across their lifecycle stages, which includes manufacturing, utilisation, and disposal. For example, pharmaceuticals are responsible for 25% of the annual emissions from the National Health Service, UK⁽³⁾. Having a comprehensive understanding of these impacts is crucial for informed decision-making regarding medication funding, recommendations, and identifying areas of intervention to reduce this impact on our planet.

Examples:

University of Montana's curriculum includes teaching about pharmaceutical industry and manufacturing-related environmental toxins, and pharmaceutical life-cycle analysis.

Monash University's 'Quality use of medicines and environmental sustainability' describes the contamination of natural waterways by active pharmaceutical ingredients.

Queen's University Belfast has a "Level 1" workshop where students are tasked with deciding what Sustainable Development Goals need to be considered in order to ensure sustainable production and roll out of a new drug under development for a chronic disease.

In their pharmaceutical toxicology course, Hacettepe University defines the impact of pharmaceuticals on water and soil pollution and the impact that has on humanity. They then go on to discuss ways to solve these issues, how to gain knowledge about sustainable production and control waste.

At the University of Auckland, there is facilitated class discussion surrounding the pollution induced by the production and usage of medicines. There is a debate at the end of this workshop discussing who should be responsible for the waste.

University College London has sessions which outline how pharmaceuticals can make their way into the water cycle, and considers the contributions of pharmaceutical production, usage, and behaviour and what can be done about each of these. These include approaches based on green chemistry, reducing unnecessary use, and addressing medicines waste.

4. INCLUDE PLANETARY HEALTH TEACHING WITHIN KEY CLINICAL AREAS OF THE CURRICULUM

Including teaching on the impact of climate change on fundamental areas such as cardiovascular health, respiratory health, infectious diseases, cancer and mental health related conditions will equip future pharmacists with the knowledge they need to improve patient outcomes. Greenhouse gas emissions contribute to more than 25% of global deaths from heart attacks, strokes, lung cancer and chronic respiratory disease⁽⁴⁾. Such conditions do not encompass the entirety of health, however they are substantial aspects of our clinical teaching and global health and thus provide an important opportunity for inclusion of planetary health teaching.

Examples:

Virginia Commonwealth University's curriculum discusses air pollution as a disease exacerbating factor in the respiratory module.

Keele University includes antimicrobial lectures in years 2 and 3. Content includes images tracking different areas of Europe and how global warming, travel, and good antimicrobial prescribing can be used to change the types of antimicrobial resistance and the impacts on treatment options available for different severities of infections.

University of California, San Francisco has an inquiry session "Effects on Climate Change Events on Mental Health" which discusses examples of climate change events associated with poor mental health outcomes, protective and exacerbating factors, vulnerable populations more likely to experience mental health effects, and policy solutions aimed at mitigating environmental disparities. Students explore these concepts via vignettes with discussion questions, including the opportunity to practice counselling on coping mechanisms for patients in these situations.

University of Montana's Public Health course (part of their core curriculum), has multiple lectures which address a handful of infectious diseases of which infection patterns have changed due to temperature changes in the different geographical areas. The public health course also lectures about the impacts of pharmaceutical pollution and related antimicrobial resistance in India.

5. DEVELOP DEDICATED FACULTY ROLES TO ENSURE IMPLEMENTATION OF PLANETARY HEALTH WITHIN PHARMACY EDUCATION

Although vital, the incorporation of planetary health within the pharmacy education curriculum is an extensive and challenging task. Having a dedicated faculty member to take on the role of incorporating this topic into the curriculum will help overcome barriers that exist such as time and content development.

Examples:

The University of Montana, Monash University, University of California, San Francisco, University College London and Keele University have dedicated Faculty members to incorporate planetary health across the curriculum.

Other participating universities have interested faculty who incorporate planetary health into their teaching, however, this is not a defined role for them.

6. AMPLIFY STUDENT VOICES

The student voice is a powerful tool for change. Supporting student led organisations, encourages enthusiasm and innovation in planetary health. Students develop leadership, team-building skills, and essential organisational qualities that will prepare them for a dynamic career in pharmacy. Pharmacy schools should recognise and amplify voices of students that catalyze positive action in climate and patient health efforts.

Examples:

The University of California, San Francisco School of Pharmacy, has two student organizations, The Alliance for Pharmacy Sustainability and Project Safe Medication Disposal, that have hosted speakers discussing sustainable healthcare practices.

The University of Montana's Climate Response Club is a student group focused on climate change, planetary health, and connecting students with opportunities to create positive change at the university.

At the University of Colorado, student group Fossil Free started events to support divestment from fossil fuels. Pharmacy student-led organizations such as SHIMP (Society of Herbal and Integrative Medicine Pharmacists) regularly host speakers for sustainable health topics.

7. PROVIDE PLANETARY HEALTH RESEARCH OPPORTUNITIES FOR STUDENTS

Providing teaching on planetary health and sustainability, requires research to be carried out to underpin such knowledge.

Offering planetary health research opportunities to students increases student engagement and understanding of planetary health, and is vital to progressing sustainable pharmacy practice.

Examples:

University of California San Francisco offers a fellowship program open to pharmacy students (The UCSF Carbon Neutrality Initiative Fellowship), which provides funding for students to lead projects on carbon neutrality.

The University of Auckland provides research opportunities for students related to health/sustainable healthcare.

8. PROMOTE INTER-INSTITUTIONAL COLLABORATION

As healthcare professionals, we work as part of a multidisciplinary team. Facilitating shared learning through collaboration between institutions, enhances knowledge exchange, improves resource optimisation and accelerates the reduction of the negative impact of healthcare on the environment. Environmental efforts require a multifaceted, collaborative approach to ensure support for and progression of sustainable pharmacy practice.

Example:

Keele University is collaborating with Trinity College Dublin on embedding the UN 'Education for Sustainable Development' goals into the pharmacy course in addition to current lecture and placement content. This is following guidance from the environmental sustainability in pharmacy education created by the Sustainability in Pharmacy Education (SPE) Group.

9. FACILITATE SUSTAINABLE LIFESTYLE FOR STUDENTS AND LOCAL COMMUNITIES

Making environmentally conscious choices is critical both professionally and personally to minimise our ecological footprint and improve planetary health. Embracing sustainability can also lead to cost savings, improved public perception, and a greater sense of personal fulfillment as we align our actions with our values of environmental stewardship and responsibility. So it is vital for our institutions to facilitate this and encourage sustainable practices.

Examples:

Virginia Commonwealth University has a community garden on campus and an outdoor adventure program. Organizations within the school also occasionally host drug take-back days to encourage proper disposal of medications within the community that students are able to volunteer for.

Queen's University Belfast has some student accommodation where students can get involved with their student allotment. The allotment team provides free gardening sessions alongside the Conservation Volunteers, teaching students how to grow their own food and harvest food for the onsite community fridge.

10. UNDERSTAND THE CARBON FOOTPRINT OF PHARMACY SCHOOL AND INSTITUTIONAL ACTIVITIES

Elevated levels of carbon dioxide in the atmosphere poses a direct risk to human health. Understanding our carbon footprint enables us to identify areas where improvements can be made to slow down the acceleration of climate change. Calculating carbon footprint is applicable to understanding and reducing the carbon footprint of healthcare and reducing the negative global health outcomes related to climate change.

Examples:

Monash University's optional topic 'Quality use of medicines and environmental sustainability' discusses the carbon emissions generated by healthcare systems.

University of California, San Francisco's "Spare the Air" lecture discusses greenhouse gas emissions from the US healthcare system.

University College London has lectures and workshops which include the impact of pharmaceuticals on the NHS carbon footprint and the medicines/types of formulation with the highest impact.

6. SCHOOL-SPECIFIC REPORT CARDS



Overall	B+
Curriculum	A-
<p>Overall, the UMT Skaggs School of Pharmacy covers a variety of sustainability topics at varying depths. Some of the greatest topics of coverage include forest fires and smoke impacts, severe weather, and carbon footprints of healthcare systems. There are many categories in which we scored one less point than the maximum, and this is typically due to a topic being covered only briefly in the core curriculum. Thus, an area of improvement for our curriculum category would involve exploring some topics at a more in-depth level in the core curriculum.</p>	
Planetary Health Research	A
<p>The score that has been achieved in this category is mainly due to the many opportunities outside of the core curriculum at our pharmacy school that cover planetary health-related topics. These opportunities are built into elective courses that students may choose to take. The only area for improvement by our institution in this category would surround the involvement of those in the community helping to shape what research occurs on campus.</p>	
Community Outreach and Advocacy	B
<p>From this section, our pharmacy school scored max points in 2 of 3 areas. No points were awarded regarding regular updates or communications that relate to sustainability or planetary health, as these topics are not mentioned in regular communications from the pharmacy school. Including sustainability topics in some regular communications would be a good place to start.</p>	
Support for Student-Led Initiatives	A-
<p>The greatest area for improvement in this section would surround access to specific research programs for students interested in healthcare-related sustainability and/or planetary health research. Fortunately, our institution does have many extra-curricular opportunities involving planetary health and sustainability that boost our overall score in this section.</p>	
Campus Sustainability	C-
<p>The two areas of greatest improvement lie in lab sustainability and fossil fuel divestment. We believe that starting with lab sustainability would be the most achievable area to start in and would provide a great impact on this section, as UMT is an R1 university, meaning that research</p>	



Overall	B
Curriculum	C
<p>Monash University's Bachelor of Pharmacy (Honors) curriculum addresses several key elements of planetary health education, although this is limited in both depth and scope. The curriculum maintains a strong focus on the intimate relationship between the environment and human health. Such concepts are embedded into compulsory coursework in the form of preparatory readings, lecture materials and small group activities. However, these planetary health components are typically non-exhaustive and lack detail.</p>	
Planetary Health Research	A-
<p>In 2024, the faculty appointed Dr Suzanne Caliph as the Sustainability Lead. In terms of learning opportunities, the 'Human Health and Climate Change Virtual Exchange Program' is available for fourth year students who are interested in the Collaborative Online International (COIL) experience. There are also faculty researchers who are co-investigators in the 'Pharmacy, Environment and Climate Change' research survey. This study enables pharmacists, academics, and pharmacy students to provide input and voice their stories on climate change. PhD students from the Centre for Medicines Use and Safety have also published a study titled 'Pharmacy students' perceptions on environmental sustainability in pharmacy education and practise'.</p>	
Community Outreach and Advocacy	B
<p>In 2023, a 'Sustainability in Pharmacy and Pharmaceutical Science Education' working group was formed (supported by the Monash Sustainable Development Institute) on embedding sustainability and planetary health across all courses in the faculty and finding opportunities to share teaching and learning activities. Through increased partnerships with various organisations, Monash University has not only established important industry relationships but have also provided opportunities for students to learn about planetary health and sustainability.</p>	
Support for Student-Led Initiatives	A-
<p>Student-led initiatives receive robust support from the Monash Pharmacy and Pharmaceutical Sciences Faculty. While there are limited research opportunities with planetary health as its core focus, Monash University has invested in programs such as the University Community Farm, making the program widely available for pharmacy students and the wider Monash student cohort to take participate in.</p>	
Campus Sustainability	A
<p>The Buildings and Property Division at the Faculty of Pharmacy and Pharmaceutical Sciences have an established sustainability team. The sustainability team runs a program called 'Green Impact' where staff and students implement actions set out in the 'Green Impact Toolkit'. Monash University has made a commitment to achieve Net Zero emissions by 2030 with a well-defined and adequate plan in place. Monash University has commenced implementation of Monash-Engie Alliance to explore opportunities to co-develop scalable zero-carbon solutions.</p>	



Overall	C+
Curriculum	B-
<p>The University of California, San Francisco (UCSF) School of Pharmacy (SOP) curriculum addresses several aspects of planetary health, however the depth of coverage is limited to three required sessions. Some topics are only briefly mentioned and limited to a single slide or two. Others are discussed in greater depth. Content focuses on relevant, real life examples for students to learn and practice applying their knowledge. We recommend: More robust integration of planetary health across the UCSF SOP curriculum by incorporating at least one planetary health topic per block. Additionally, faculty education on the impacts of climate on health could allow for more explicit connections between disease states and climate change during relevant lectures. We recommend the continued use of patient cases and other active learning methods to help students identify opportunities for planetary health mitigation and adaptation.</p>	
Planetary Health Research	B-
<p>One UCSF SOP researcher has conducted studies evaluating the effect of instructional sessions about planetary health on student outcomes. Some researchers within the SOP focus on health disparities, but not specifically those caused by climate change or other environmental conditions. There are researchers within UCSF but outside of the SOP who do conduct research on the impacts of climate on health. We recommend: Increasing the focus on planetary health and pharmacy sustainability within our research program to advance knowledge and practices in this area. This research should ideally address and include those who are most deeply affected by environmental conditions in our community.</p>	
Community Outreach and Advocacy	F+
<p>UCSF SOP has not formally partnered with organizations that promote planetary health or sustainable practice. Outside of the SOP, UCSF has two centers, the EaRTH center and Center for Climate, Health and Equity, that address these topics. We recommend: Partnering with organizations to demonstrate dedication towards sustainable healthcare practice and education and broadening the opportunities available to students.</p>	
Support for Student-Led Initiatives	C-
<p>The UCSF EaRTH Center, Center for Climate, Health and Equity, and Office of Sustainability provide support for student-led initiatives. UCSF also provides free access to outdoor programs for students. We recommend: UCSF SOP may consider strengthening relationships with the UCSF EaRTH Center, Center for Climate, Health, and Equity, and Office of Sustainability. One way to achieve this is through pre-existing student organizations, such as the Alliance for Pharmacy Sustainability or the Human Health and Climate Change Club.</p>	
Campus Sustainability	B

UCSF is committed to reducing their carbon footprint and transforming into a sustainable institution. Additionally, UCSF has sought to include sustainable practices throughout the institution, from the labs to the professional schools. UCSF has set a goal to become carbon neutral by 2025 and has voted to divest from all companies on the Carbon Underground 200 List

Overall	C+
Curriculum	C+
<p>UCL School of Pharmacy covers some elements of sustainable healthcare in the curriculum, but there is room for further improvement. Recommendations: this baseline assessment can be used to identify areas for improvement in terms of addition of new material, together with better signposting of the existing elements relating to sustainability to enable students to more easily identify and make connections between these.</p>	
Planetary Health Research	C
<p>There is some research under way in relation to planetary health research, and some members of staff with an interest in this area. Recommendations: to build on current practice to conduct and share further research in this field.</p>	
Community Outreach and Advocacy	C
<p>UCL School of Pharmacy has little community outreach linked to planetary and environmental health. Recommendations: more community partnerships relating to planetary health and environmental health in UCL pharmacy school</p>	
Support for Student-Led Initiatives	B
<p>There is some good support for student-led initiatives at UCL. Recommendations: to encourage students at UCL School of Pharmacy to get further involved with these initiatives.</p>	
Campus Sustainability	B
<p>There are some elements of good practice in relation to sustainability within the buildings at UCL in general and UCL School of Pharmacy in particular. Recommendations: to have more local ownership of sustainability plans at the School of Pharmacy.</p>	



Overall	C+
Curriculum	C+
<p>Topics on planetary health are present throughout the course in the way of lectures, assignments and interprofessional days which focus on the underlying benefit to patients and their health. It would be better for links to climate change to be more specific in the teaching as this will give students a clear idea on how changing medications can have an impact on climate change.</p>	
Planetary Health Research	D
<p>Keele has hosted talks in the past looking at this area and should continue. Staff members are also encouraged to look at and develop research that promotes sustainability.</p>	
Community Outreach and Advocacy	D
<p>Keele is currently partnering with several community organisations to promote planetary health within the university and wider community. It would be good if more students were encouraged to be involved with these organisations and if the School of Pharmacy and Bioengineering (PhaB) became a member of a planetary health or ESH organisation.</p>	
Support for Student-Led Initiatives	B
<p>PhaB has good communication networks to let students know about any opportunities for students to take part in. There could be more pharmacy-specific/ sustainable healthcare opportunities. Students should also be reminded of the funding that is available to them to make societies more sustainable.</p>	
Campus Sustainability	B
<p>Keele has a goal to achieve Carbon Neutrality by 2030 and is also committed to helping Staffordshire County achieve this as well. PhaB has also implemented a note on sustainability to try to reduce the amount of single-use plastic, reminding students of the need to plan their experiments beforehand.</p>	



Overall	C
Curriculum	C-
<ul style="list-style-type: none"> QUB pharmacy curriculum is effective in outlining the impact of certain dosage forms and production processes on the environment. Inclusion of climate focused teaching through increased incorporation of the Sustainable Development Goals has commenced and is due to introduce further sustainability learning in the coming years. Recommendations: Lectures, workshops and patient simulations could increase planetary health learning with possible topics for inclusion highlighted throughout this report. Consider what other Schools of Pharmacy have adopted and discuss how learning can be facilitated. Direct communication from School to promote Carbon Literacy Training. 	
Planetary Health Research	C
<ul style="list-style-type: none"> Although many researchers throughout the institution are working on planetary research, no members of the School of Pharmacy are directly involved. Recommendations: Current and potential planetary health research to continue to be supported by Queen's institution, and interdisciplinary research encouraged. The School of Pharmacy could review potential of commencing pharmacy research oriented towards improving planetary health. 	
Community Outreach and Advocacy	D
<ul style="list-style-type: none"> QUB as an institution to continue partnerships with community organisations through their curriculum (SSCs) and the Centre for Public Health. Recommendations: The pharmacy school consider partnering with community organisations and become more involved in developing community facing events focussed on planetary health. 	
Support for Student-Led Initiatives	A
<ul style="list-style-type: none"> QUB have made substantial efforts to provide avenues for students to get involved in Planetary research. Volunteering opportunities exist within the student Union and Sustainability Team, and can be explored on the Sustainability webpage. Recommendations: Increase opportunities within the School of Pharmacy for students to partake in sustainability research and provide clear information as to how students can access this. 	
Campus Sustainability	B
<ul style="list-style-type: none"> The LEAF lab scheme and recycling schemes within QUB have contributed towards reducing the institution's polluting impact. Recommendations: Continue to refine the steps required to achieve goals outlined in the 2040 Net Zero target. Divestment from fossil fuels, incorporation of campus wide waste reduction plan and efficient utilisation of clean energy should be prioritised. 	



Overall	C
Curriculum	D
<p>The BPharm curriculum prepares students for real-life clinical settings and essential knowledge on climate change impacts. There is coverage of topics such as antimicrobial resistance and inequities caused by climate change, but more topics could be added. For example, effects of pharmaceutical manufacturing related toxins and the environmental impact of dosage forms, medication delivery devices, and/or excipients. In addition, there are concepts such as polypharmacy and respiratory dosage forms that are already taught without mentioning the impact on climate change. This could be remedied without making structural changes to the curriculum by explicitly discussing climate change wherever appropriate.</p>	
Planetary Health Research	B-
<p>There are staff members researching aspects of planetary health, but there is little connection between the wider community and the challenges they face due to deteriorating planetary health. Thus, research being conducted may not be pertinent to the most pressing concerns of those living through the crisis of poor planetary health.</p>	
Community Outreach and Advocacy	D
<p>There would be benefits to the School of Pharmacy connecting with the local community about planetary health. In addition, the School could consider joining planetary health or Environment, Safety and Health (ESH) organisations, such as Planetary Health Alliance, to obtain and provide a more global perspective of planetary health impacts to students and staff.</p>	
Support for Student-Led Initiatives	C-
<p>A plethora of opportunities to engage and learn about climate change are offered by student organisations at the University. The School of Pharmacy could liaise with staff and students involved in central University initiatives to increase awareness and expand opportunities available to pharmacy students. This may result in more research projects involving planetary health being offered to and driven by pharmacy students. There is also room for some groups to highlight how health professionals work alongside community leaders to overcome challenges.</p>	
Campus Sustainability	B+
<p>The University of Auckland has an ambitious goal to be carbon neutral by 2030. This includes divestment from fossil fuels and several sustainability networks and initiatives. However, there has been little direct involvement from the School of Pharmacy in this initiative as of yet. Thus, a plan should be drafted.</p>	

Overall	D+
Curriculum	D-

In the 2023-24 academic year, additional updates were made to the PharmD curriculum for the Class of 2027 and beyond. The “Human Health and Climate Change” elective, which supported numerous metrics in the previous report, was not available this year.

We recommend; consider climate health as a factor in human health throughout the core curriculum. Pharmacotherapy (PT) courses already discuss the importance of non pharmacological management (diet, physical activity, exposure to risk factors, etc.) and patient specific factors (behavioral, social, economic, etc.) in health outcomes. **Specific topics to consider:** air quality, allergens, wildfires, extreme weather events, vector borne diseases, food/water security, healthcare utilization and resilience, as well as the impacts of forced migration, civil conflict and mental health. Further discussion could include waste management, global social disparities, policy, and regulation.

Planetary Health Research	B-
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Planetary health is not a primary research focus at the School of Pharmacy. There are currently no processes identified where community members can make input on the pharmacy school’s research agenda, but openings to implement this may exist.

We recommend; continue supporting faculty and speakers who engage in planetary health. Groups like the [Center for Drug Discovery](#) and [CU Technology Innovation Discovery Entrepreneurship](#) could further amplify these topics.

Community Outreach and Advocacy	D
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The School of Pharmacy partners with local organizations but these efforts do not yet encompass planetary health. **We recommend;** implement environmental health into our outreach and advocacy, as well as service learning projects by teaching local youth about accessible climate topics like air quality. Explore how the school can become a member of national or international planetary health organizations.

Support for Student-Led Initiatives	C+
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Continue supporting student organizations and initiatives. **We recommend;** expanding sustainable healthcare research programs for pharmacy students. Create a resource to collect information related to planetary health activities, organizations and mentors.

Campus Sustainability	B
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CU Anschutz has a Sustainability Manager. There are ongoing efforts to improve sustainability on campus. All materials in the PharmD program are offered electronically. **We recommend;** establishing an Office of Sustainability, incentivize fuel and energy efficiency. Highlight and emphasize accomplishments in campus sustainability, raising awareness on the benefits and savings produced by the 5 LEED Gold rated facilities on campus.



Genel	D+
Müfredat	D
<p>Gezegensel sağlık, sadece üniversite bünyesindeki öğrencileri değil dünya üzerindeki tüm insanları etkilemektedir. Başta üniversitelerde verilen müfredatlar genişletilerek ve iklimin, kirliliğin ve birçok konunun üzerinde durularak gezegensel sağlığın sürdürülebilirliği artırılabilir. Derslerimizde gördüğümüz konular genel olarak, çekirdek müfredatımızda kısaca değinilmekte olup iklim krizine, çevresel toksinlere, karbon ayak izine ve bu konuların sağlıkla olan ilişkisi incelenmektedir.</p>	
Gezegensel Sağlık Araştırmaları	B-
<p>Eczacılık fakültesindeki dersler ilaç bilimleri üzerine odaklanırken, gezegensel sağlık araştırmaları daha geniş bir perspektif sunarak çevresel faktörlerin sağlık üzerindeki etkilerini anlamamıza yardımcı olur. İklim eşitsizliği, sürdürülebilirlik ve çevresel eşitsizlik konuları fakültemizde kısaca bahsedilmektedir.</p>	
Toplumsal Sosyal Yardım ve Savunuculuk	F-
<p>Fakültemiz bünyesinde gerçekleşen derslerimizde bu konulara ve çabalara ilişkin bir içerik mevcut değildir.</p>	
Öğrenci Liderliğindeki Girişimlere Destek	D
<p>Bu kapsamda fakültemizde bulunan öğrenci grupları fakültenin desteği dışında bu tür faaliyetleri yürütmekte, sürdürülebilirlik çalışmaları da öğrencilerin inisiyatifiyle ilerlemektedir.</p>	
Kampüs Sürdürülebilirliği	C

Fakültemizde sürdürülebilirliği destekleyen ofisler ve projeler mevcuttur. Geri dönüşüm programları, kağıt kullanımını azaltmaya yönelik projelerle kampüsümüzün sürdürülebilirliği ilerletilirken fosil yakıtlar ve karbon ayak izi derslerimizde nadiren bahsedilmekte ve kampüsümüzde bu tıp projeler yürütülmemektedir.



Overall	D
Curriculum	D-
<ul style="list-style-type: none"> Planetary health topics are not often covered in the core curriculum. If covered, they are only briefly mentioned and not covered in depth. There are no electives currently offered at VCU that explore planetary health. There is an interdisciplinary global health elective VCU is currently working to update the curriculum, serving as an opportunity to incorporate planetary health topics both more frequently and in-depth. 	
Planetary Health Research	C
<ul style="list-style-type: none"> There is planetary research conducted by professors at VCU in the Medicinal Chemistry department. There is a lack of planetary health research in other departments of the school. During P3 year, there is an option for students to work with professors on a research project for credit. The students are able to choose their topic for the project, however students typically assist professors with projects related to topics they have previously conducted research in. 	
Community Outreach and Advocacy	F+
<ul style="list-style-type: none"> The university has a whole is active within the sustainability community The School of Pharmacy may partner with the community to conduct sustainability-related events a few times each year, but these events continue to be student-led initiatives and not annual activities of the school. 	
Support for Student-Led Initiatives	C
<ul style="list-style-type: none"> The School of Pharmacy offers lots of opportunities for students to take their own initiative whether it be on a research topic or starting a new student organization, among other activities. Students may choose a topic on sustainability on their, however VCU is not actively offering these opportunities for students Our sustainability organization within the school of pharmacy "The Sustainable Pharmacy Project (SPP)" is currently lacking both faculty and peer support from the school despite recruitment efforts 	
Campus Sustainability	C
<ul style="list-style-type: none"> VCU has several programs to create campus sustainability, but are oftentimes not advertised well to students, creating an opportunity for the school to increase outreach/advertising on sustainability initiatives 	

7. LIMITATIONS

❖ LIMITED REPRESENTATIONS OF SCHOOLS

Although the PHRC for pharmacy is growing each year, factors such as the demands and high volume workload posed by the pharmacy degree and apprehension from some institutions to share their reports, resulted in a small sample size. While we celebrate the contributions of the participating teams, we acknowledge that the data presented in this report may not fully represent the attitudes and approaches to planetary health taken by all pharmacy schools globally.

❖ DISCREPANCIES IN INTERPRETATION

There will always be a degree of subjectivity in interpretation of the metrics. What one team may classify as “brief coverage,” another may rank as “in depth coverage,” thus potentially affecting overall grades. Since beginning the PHRC for pharmacy in 2021, we have been able to provide pharmacy specific examples of what constitutes 'brief' and 'in depth' to enhance clarity and provide a frame of reference when filling out the metrics. We intend to add to and appraise these examples annually. What's more, the University of Nottingham offered a formal dissertation research project to their students in 2023 which evaluated the PHRC metrics themselves and discussing a standardised methodology. This will be invaluable to further developing the PHRC for Pharmacy as a research model.

8. FUTURE DIRECTIONS

❖ INCREASE GLOBAL REACH

We plan on increasing the number of participating pharmacy schools in order to provide a wider understanding of planetary health topics in pharmacy programs and expand our impact across the globe. We are confident that as more pharmacy schools participate, this will quickly become an initiative which institutions are determined to be part of as is seen in medical schools. Furthermore, this year collaborations with the British Pharmaceutical Students' Association (BPSA) and International Pharmaceutical Students' Federation (IPSF) have been established; discussing developments such as student sustainability representatives within universities worldwide and increasing the global reach of the PHRC for Pharmacy. We are very grateful for the support from the BPSA and IPSF for the PHRC for Pharmacy

❖ CLARIFICATION AND STANDARDISATION OF METRIC SCORING AND COMPLETION

As discussed above, this year, we have been able to provide pharmacy specific examples of what constitutes 'brief' and 'in depth' to enhance clarity and provide a frame of reference when filling out the metrics. Furthermore, the University of Nottingham have used the PHRC for Pharmacy for their formal dissertation research project this year. The students have been analysing the metrics' robustness and content. They have also explored standardising the process in which schools approach filling out the metrics such as through using a pre-set questionnaire aiming to remove ambiguity. This is invaluable data and input which will inform and progress the PHRC moving forwards. Nonetheless, the emphasis of the PHRC for Pharmacy remains to encourage openness and transparency, willingness to evoke positive change and ultimately lead to a reduction in the negative environmental impact of pharmacy on our planet, as opposed to requiring perfectionism.

8. FUTURE DIRECTIONS

❖ INCREASED FACULTY INVOLVEMENT

We welcome and value faculty involvement when completing the PHRC. There have been faculty mentor(s) associated with every team this year, which was not observed with the pharmacy pilot. We understand that faculty assist students in their own time and provide support extra to their teaching and academic commitments. Thus, funding faculty specific to planetary health teaching and research is desirable for further advancements in this area. Thank you to faculty assisting and encouraging the PHRC in Pharmacy.

PHARMACY TRAINING

Planetary health and sustainability within healthcare is a rapidly emerging and evolving field and something which is increasingly in the consciousness of healthcare professionals around the world. Recent advancements made in planetary health education in pharmacy include the establishment of the Sustainability in Pharmacy Education (SPE) Working Group, involving faculty from all UK pharmacy schools, enabling collaboration and advancement in planetary health within pharmacy education. Also, Rx for Climate includes pharmacy academic tutors and students from USA, UK, Canada and Australia and facilitates a similar forum for educational advancements in this area. Further, in Canada, the Canadian Association of Pharmacy for the Environment (CAPHÉ) was established with the mission to promote and improve planetary health among the Canadian pharmacy profession. Additionally, the Canadian Society of Hospital Pharmacists Sustainability in Pharmacy Taskforce was developed to research, identify and prioritize goals related to the climate crisis.

PHARMACY TRAINING

The future direction of sustainability in pharmacy is exciting, however, there is still scope for more.

❖ EXTRACURRICULAR ACTIVITIES

Pharmacy programs could consider providing extracurricular learning opportunities, such as talks featuring experts in planetary health or members of community organisations.

❖ SUSTAINABILITY STUDENT REPRESENTATIVES

Establishing sustainability representatives within pharmacy student organisations in every university could create a key avenue by which pharmacy students are made aware of and motivated to join planetary health events, initiatives, and to encourage their institution to work sustainably. This would ensure that environmental pharmacy is understood by students and this can motivate them and their institution to take action when possible.

❖ SUPPORT AND RESEARCH

The creation of formal planetary health or sustainable healthcare research programs or tracks would increase opportunities for students and faculty to partake in such research. This would require support and funding from institutions, such as the research using the PHRC done at the University of Nottingham.

❖ INCORPORATION INTO CORE CURRICULUM REQUIREMENTS

Incorporating planetary health and sustainable healthcare into the core pharmacy curriculum would allow pharmacy students to discuss the wide-ranging effects of pharmacy on the environment to the fullest extent.

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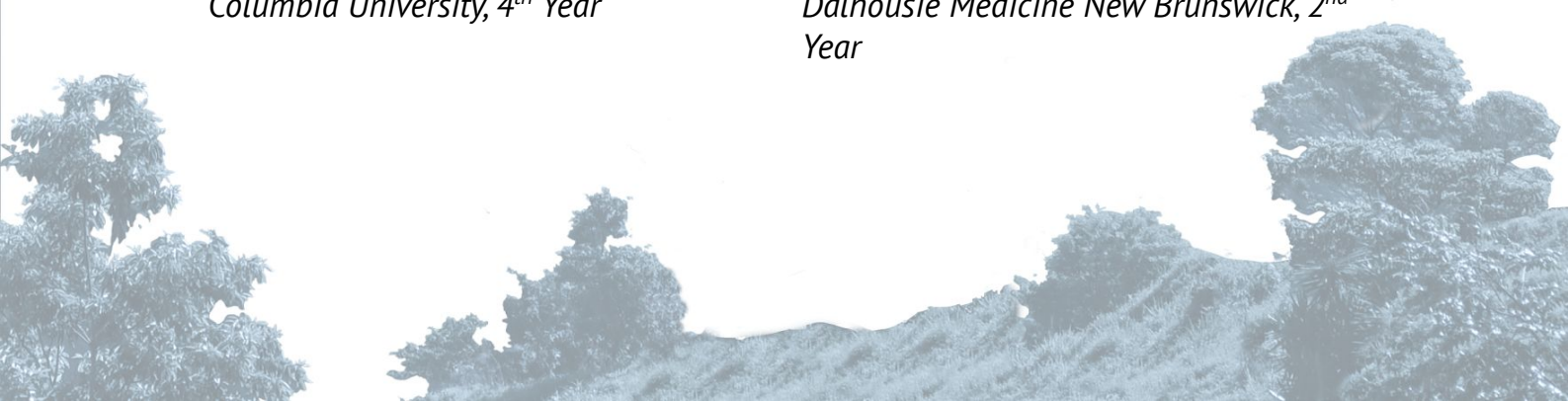
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<https://www.rxforclimate.org>

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<https://www.bpsa.co.uk>

- International Pharmaceutical Students' Federation (IPSF)

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13. METRICS



PLANETARY HEALTH CURRICULUM

This section evaluates the integration of planetary health topics into the pharmacy school curriculum. Pharmacists will be on the frontlines of tackling and treating the health effects of climate and other environmental changes. Therefore, it is critical that pharmacy students understand planetary health issues and learn how to practice sustainably and reduce the environmental impact of medicines and devices.

- 1.1 Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?
- 1.2 Does your pharmacy school curriculum address the environmental impact of medicines in terms of their pollution, ecological impact and contamination of water systems?
- 1.3 Does your pharmacy school curriculum address the health effects of the pharmaceutical industry- and manufacturing-related environmental toxins?
- 1.4 Does your pharmacy school curriculum address the carbon footprint of healthcare systems?
- 1.5 Does your pharmacy school curriculum address the impact of climate change on the changing patterns of infectious diseases and increased antimicrobial resistance?
- 1.6 Does your pharmacy school curriculum address the respiratory health effects of climate change and air pollution?
- 1.7 Does your pharmacy school curriculum address the cardiovascular health effects of climate change, including increased heat?
- 1.8 Does your pharmacy school curriculum address the relationship between climate change and allergies?
- 1.9 Does your pharmacy school curriculum address the mental health and neuropsychological effects of environmental degradation and climate change?

13. METRICS

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

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

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

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

- Waste production within the healthcare system and strategies for reducing waste in clinical activities such as single-use plastic and packaging.
- 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).
- The impact of extreme heat, on patients on medications which can interfere with thermoregulation.
- The impact of anaesthetic gases on the healthcare carbon footprint.
- 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.
- The health and environmental co-benefits of non-pharmaceutical management of conditions where appropriate such as exercise or yoga classes for type 2 diabetes.
- 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

13. METRICS

- 1.14** Does your pharmacy school curriculum discuss the environmental implications of various dosage forms, medication delivery devices, and/or excipients?
- 1.15** 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?
- 1.16** 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?
- 1.17** Is your pharmacy school currently in the process of implementing or improving Education for Sustainable Healthcare (ESH)/planetary health education?
- 1.18** Does your pharmacy school have a member of faculty to incorporate planetary health and sustainable healthcare as a theme throughout the curriculum?
- 1.19** 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?
- 1.20** 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?

13. METRICS



PLANETARY HEALTH RESEARCH

This section evaluates the quality and quantity of planetary health research at the pharmacy school and with the wider institution. Planetary health is an emerging field. To facilitate appropriate teaching on planetary health, pharmacy schools should support research in areas such as the health effects of climate change, adaptive measures and pharmacy's environmental impact.

- 2.1 Are there researchers engaged in planetary health research and healthcare sustainability research at your pharmacy school?
- 2.2 Has your institution recently provided extra curricular talks or learning opportunities on topics related to planetary health?
- 2.3 Is there a process by which communities disproportionately impacted by climate change and environmental injustice give input or make decisions about the research agenda at your pharmacy school?

13. METRICS



COMMUNITY OUTREACH AND ADVOCACY

This section evaluates pharmacy school engagement in community outreach and advocacy efforts associated with planetary health. Climate change disproportionately impacts under-resourced populations and communities of colour, therefore, it is critical that pharmacy schools and their institutions directly engage with communities most affected by environmental health harms and provide opportunities for student involvement.

-
- 3.1** Does your pharmacy school partner with community organisations to promote planetary and environmental health?
 - 3.2** Does your pharmacy school have coverage of issues related to planetary health and/or sustainable healthcare in their update communications?
 - 3.3** Is your pharmacy school a member of a national or international planetary health or ESH organisation?

13. METRICS



SUPPORT FOR STUDENT-LED PLANETARY HEALTH INITIATIVES

This section evaluates institutional support for student-led planetary health initiatives such as quality improvement and information sharing. Students are the future of the work force and shape the future of the pharmacy profession therefore, it is vital they are supported in engagement with emerging fields in healthcare such as planetary health.

- 4.1 Does your institution offer opportunities for pharmacy students to do research related to planetary health and/or sustainable healthcare?
- 4.2 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.
- 4.3 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?
- 4.4 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)
 - 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.
 - Panels, speaker series, or similar events related to planetary health that have students as an intended audience.
 - 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.
 - Cultural arts events, installations, or performances related to planetary health that have students as an intended audience.
 - Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts.
 - Wilderness or outdoors programs (e.g., that organize hiking, backpacking, kayaking, or other outings for students)

13. METRICS



CAMPUS SUSTAINABILITY

This section evaluates the support and engagement in sustainability by the pharmacy school and/or institution, considering aspects including carbon footprint and waste management. Our pharmacy schools and institutions must set the standard for sustainable practices and minimising environmental impact.

-
- 5.1 Does your University have an Office of Sustainability?
 - 5.2 How ambitious is your pharmacy school/institution's plan to reduce its own carbon footprint?
 - 5.3 Does your pharmacy school have an organics recycling program (compost) and a conventional recycling program (aluminum/paper/plastic/glass)?
 - 5.4 Does your pharmacy school provide paperless teaching? e.g. lecture materials, exam papers, hand-outs
 - 5.5 Does your pharmacy school have programs and initiatives to assist with making lab spaces more environmentally sustainable?
 - 5.6 Does your institution have a strategy or timeline for divestment from fossil fuels?

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