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# Planetary Health Report Card:

## Pharmacy

*Monash University Faculty of  
Pharmacy and Pharmaceutical Sciences*

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**2023-24 Contributing Team:**

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# Statement of Purpose

## *Planetary health is human health.*

The Planetary Health Alliance describes planetary health as, “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth”[1]. This definition is intentionally broad, intended to encompass the multitude of ways that the environment can affect health, including water scarcity, changing food systems, urbanisation, biodiversity shifts, natural disasters, climate change, changing land use and land cover, global pollution, and changing biogeochemical flows. The health of humanity is dependent on our environment and our environment is changing rapidly and in disastrous ways. Although the World Health Organization has called climate change “the single biggest health threat facing humanity”[2] many pharmacy schools’ institutional priorities do not reflect the urgency of this danger to human health. Fossil-fuelled electricity and gas and medical or pharmaceutical products used in healthcare account for around 8% of the total global greenhouse gas footprint of healthcare[3] with pharmaceutical waste also providing a dangerous contaminant to our water systems [4]. Metered dose inhalers contribute 500g 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, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices as much as possible, and engaging with surrounding communities that are most affected by environmental threats, and hold those who are not accountable. Because climate change and environmental threats disproportionately affect vulnerable populations [7] (for example, communities of colour, older adults sensitive to health threats, and individuals in low-resource settings), these issues are inherently ones of equity and justice.

With the purpose of increasing planetary health awareness and providing recommendations and opportunities for improvement among pharmacy schools, we have created a Planetary Health Report Card that pharmacy students internationally can use to grade and compare their institutions on an annual basis. This pharmacy-student-driven initiative aims to compare pharmacy schools nationally and internationally on the basis of discrete metrics in five main category areas: 1) planetary health curriculum, 2) planetary health research, 3) university support for student

planetary health initiatives, 4) community outreach centred on environmental health impacts, and 5) pharmacy school campus sustainability.

## Definitions & Other Considerations

### Definitions:

- **Planetary Health:** is described by the *Planetary Health Alliance* as “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth” [1]. For example, topics such as climate change, declining biodiversity, shortages of arable land and freshwater, and pollution would all fall under the realm of planetary health. Both planetary health and traditional ‘environmental health’ examine the relationship between human health and the external environment, including extreme temperatures, chemicals, vector-borne diseases, etc. Planetary health explicitly concerns itself with the potential health harms associated with human-caused perturbations of natural systems. Therefore, the human health focus of planetary health makes the field well-adapted for the context of pharmacy school education. Throughout this report card, we use the term planetary health to refer to this broad swath of topics, but resources do not need to explicitly include the term “planetary health” to satisfy the metric.
- **Education for Sustainable Healthcare (ESH):** is defined as “the *process of equipping current and future health professionals with the knowledge, values, confidence and capacity to provide environmentally sustainable services through health professions education. We define a health professional as a person who has gained a professional qualification for work in the health system, whether in healthcare delivery, public health or a management or supporting role and education as ‘the system comprising structures, curricula, faculty and activities contributing to a learning process’*” [8]. Planetary Health Education is an integral part of this education rather than an end in itself. This is because knowledge about planetary health is required to fully understand the necessity of sustainable healthcare. It is also part of the broader knowledge needed to fully protect and promote health.
- **Pharmacy School vs. Institution:** When “pharmacy school” is specified in the report card, this only refers to the curriculum and resources offered by the school of pharmacy and does not include offerings from other parts of the university (for example, undergraduate departments [USA], other related departments e.g. Public Health, Population Health departments). In contrast, when “institution” is specified in the report card, we are referring to the university more broadly. Any resource reasonably accessible

by pharmacy students, no matter where in the institution the resource comes from or if it is specifically targeted for pharmacy students, can meet this metric.

- **Community organisations:** For most institutions, there are existing groups that are not directly affiliated with the university and exist as a product of what the community the institution exists in cares about or needs. These specific community organisations relevant to this report include those that are focused around some aspect of climate and health preservation. These community organisations can include but are not limited to local mutual aid initiatives, underserved-resource distribution groups, clean-up and nature conservation groups, community gardeners, and other environmental-related organisations. If your institution does not have access to local volunteerships with community groups, please report any community organisations your institution or school has collaborated with.

## Summary of Findings

<b>Overall</b>	B
<b>Curriculum</b>	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>	
<b>Planetary Health Research</b>	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>	
<b>Community Outreach and Advocacy</b>	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>	
<b>Support for Student-Led Initiatives</b>	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>	
<b>Campus Sustainability</b>	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>	

## Planetary Health Curriculum

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

1. Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation: In the PHR2041 (Comprehensive Care: Gastrointestinal and Respiratory) unit, second-year pharmacy students participated in a compulsory interprofessional activity with second-year medicine students. This activity, called 'Collaborative Care - Action on Asthma', explored the clinical case of a thunderstorm asthma emergency. The in-workshop discussion briefly identified climate change as a cause of more frequent and severe thunderstorm asthma episodes. The preparatory materials, however, did not make an explicit connection between thunderstorm asthma and human-driven environmental change. Furthermore, in the PHR2141 (Comprehensive Care: Dermatology and Pain) unit, sudden temperature change and extreme weather events are included as possible triggers for migraine episodes. Similarly, there was no further explanation as to the role of climate change in driving such events.</i></p>	

**2. Does your pharmacy school curriculum address the environmental impact of medicines in terms of their pollution, ecological impact and contamination of water systems?**

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

*Score explanation: In the PHR2021 (How Medicines Work II) unit, the compulsory topic of 'Good Manufacturing Practice' briefly outlines the environmental implications of the manufacture, use and disposal of pharmaceuticals. The preparatory materials include the PIC/S Guide to Good Manufacturing Practice for Medicinal Products, which specifically references the need for "specific measures for waste handling, contaminated rinsing water and soiled gowning" (PIC/S, 2021). Within the PHR4012 (Professional Practice V) unit, the optional topic 'Quality use of medicines and environmental sustainability' also describes the contamination of natural waterways by active pharmaceutical ingredients.*

**3. Does your pharmacy school curriculum address the health effects of pharmaceutical industry- and manufacturing-related environmental toxins?**

3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.

1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation: As mentioned in the above metric, the topic of 'Good Manufacturing Practice' within the PHR2021 unit briefly outlined the health implications of pharmaceutical industry- and manufacturing-related environmental toxins. The workshop activity included a case study on the New England Compounding Center meningitis outbreak of 2012. In-workshop discussions focused on the increased proliferation of infectious diseases such as meningitis as a serious consequence of contamination and the improper management of pharmaceutical industry- and manufacturing-related byproducts.</i></p>	

<b>4. Does your pharmacy school curriculum address the carbon footprint of healthcare systems?</b>	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation: The PHR4012 (Professional Practice V) unit contains the optional topic 'Quality use of medicines and environmental sustainability'. Within this topic, the carbon emissions generated by healthcare systems were specifically addressed.</i></p>	



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

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

*Score explanation: Throughout the PHR3141 (Comprehensive Care: Pathogens, host defence and treatment) unit, written coursework and learning activities both explicitly and implicitly addressed the impact of environmental factors on the prevalence and proliferation of communicable diseases. In the newly co-designed PHR3141 core unit, there are direct links to planetary health teaching and the changing patterns of infectious disease and increased antimicrobial resistance. For example, the topic 'Introduction to antimicrobial stewardship' described the higher prevalence of community-acquired pneumonia in the tropical regions of Australia. Within the 'Introduction to antimicrobial stewardship' topic, audiovisual materials and various compulsory readings briefly addressed the environmental implications of increased antimicrobial resistance. For example, the growing issue of antimicrobial contamination in waterways and the threat of antimicrobial resistance to the agriculture sector were mentioned. The impact of climate change on both infectious diseases and antimicrobial resistance was addressed in the planetary health virtual exchange program, offered to fourth year pharmacy students in 2023.*

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

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

*Score explanation: Several topics throughout the PHR2041 (Comprehensive Care: Gastrointestinal and Respiratory) unit addressed the respiratory health effects of climate change and air pollution. Written material in the 'Upper respiratory tract disorders' topic listed airborne pollutants (including perfumes, paint and other industrial fumes, dust, and irritants in tobacco smoke such as acrolein and nicotine) as known triggers of cough receptors in the throat and trachea, and possible causes of vasomotor rhinitis. Most notably, written material in the 'Chronic Obstructive Pulmonary Disease' topic described exposure to "cigarette smoke, occupational dust and chemicals, environmental tobacco smoke [and] indoor and outdoor pollution" as a significant risk factor for COPD. Within lectures and workshops, students were tasked with identifying and managing such exposures among patients.*

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

3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.

0	This topic is not covered.
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*Score explanation: No curriculum content was identified to support this metric.*

**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.
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2	This topic is briefly covered in the core curriculum.
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1	This topic is covered in elective coursework.
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0	This topic is not covered.
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*Score explanation: As mentioned in an earlier metric, the PHR2041 (Comprehensive Care: Gastrointestinal and Respiratory) unit contains the 'Collaborative Care – Action on Asthma' interprofessional activity. Within this activity, in-workshop discussions identified climate change as a cause of increased pollen count and proliferation, in addition to more frequent and severe thunderstorms and extreme weather events. Such environmental changes were shown to exacerbate the prevalence and severity of allergic conditions, through the clinical case of a thunderstorm asthma emergency.*

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

3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation: In 2023, an international, interprofessional planetary health virtual exchange program was offered to fourth year pharmacy students to undertake alongside their PHR5151 Inquiry and Innovation projects. The mental health and neuropsychological effects of environmental degradation and climate change were explored within this virtual exchange program. However, this metric was not addressed within the compulsory curriculum of the pharmacy degree itself.</i></p>	

<b>10. Does your pharmacy school curriculum address the unequal regional health impacts of climate change nationally and globally, including the impact of social inequality?</b>	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic was not covered.

*Score explanation: No curriculum content was identified to support this metric. Throughout many of the Professional Practice and Comprehensive Care units of the degree, coursework explicitly addressed regional health inequalities on a national and global scale. However, content focused primarily on accessibility, affordability, cultural and social barriers to health care. The regional health impacts of climate change were not included.*

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

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

*Score explanation: The PHR4012 (Professional Practice V) unit includes compulsory learning materials and activities related to social determinants of health. The relationship between climate change and social determinants of health are briefly discussed, however the topic primarily focuses on identifying and managing the social determinants themselves.*

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

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

*Score explanation: Throughout the PHR2142 (Comprehensive Care: Cardiovascular) unit, there was a strong emphasis on the importance of a primarily plant-based diet for both primary and secondary prevention of cardiovascular disease. Students developed motivational interviewing techniques and knowledge to support patients to adopt healthier eating habits, including a reduction in meat intake and increase in plant intake. However, all curriculum materials focused only on the health benefits of a plant-based diet, and did not address any environmental benefits.*

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

1	Waste production within the healthcare system and strategies for reducing waste in clinical activities such as single use plastic and packaging.
1	Patient counselling on safe disposal of medications. For example, what can be disposed of and how to locate recycling schemes, in addition to certain drugs or drug classes that are most important to dispose of properly (e.g. hormonal contraceptives, drugs that are excreted unchanged/active metabolites).
1	The impact of extreme heat, on patients on medications which can interfere with thermoregulation

1	The impact of anaesthetic gases on the healthcare carbon footprint.
1	The environmental impact of pharmaceuticals and over-prescribing as a cause of climate health harm. Alternatively, teaching on de-prescribing where clinically appropriate and its environmental and health co-benefits would fulfil this metric.
1	The health and environmental co-benefits of non-pharmaceutical management of conditions where appropriate such as exercise or yoga classes for type 2 diabetes; social group activities such as gardening for mental health conditions; active transport such as bicycle schemes for obesity. This is commonly known as social prescribing in the UK.
1	The impact and benefits of benign by design pharmaceuticals through exploring medicinal chemistry concepts and/or discussing implications of excretion of active metabolites/unchanged drug products on ecological systems

*Score explanation:*

- *Patient counselling on safe disposal of medications, including medications from certain classes such as hormonal contraceptives and Controlled Drugs are covered in the PHR4012 Professional Practice 5 Unit. Specifically, it is covered in the Quality Use of Medicines unit as well as the 'Practice Innovation Pitch Video' and written assessment.*
- *Throughout the Comprehensive Care units of the degree, in-workshop activities facilitated discussions regarding the impact of extreme heat on patients taking medications which reduce sweating or otherwise impact thermoregulation. For example, in the PHR3041 (Comprehensive Care: Blood, Brain and Cancers) unit, in-workshop discussions explored the risk of hyperthermia during Summer heatwaves and other extreme heat events among patients receiving topiramate. Written coursework that explicitly described the health impacts of extreme heat events and global warming on such vulnerable patient groups were not located.*
- *The environmental impact of pharmaceuticals, over-prescribing and deprescribing is covered in the PHR2012 Professional Practice IV unit in third year. One of the key learning outcomes is to 'Describe and apply the processes of medication management review, medication regimen simplification, deprescribing, assessing capacity to self-manage medication regimens to*

*individual patient care' as well as using the de-prescribing tool developed by the Centre of Medicines Use and Safety.*

- *Throughout the Comprehensive Care units of the degree, written coursework, case studies, role-play activities and lecture learning materials placed a strong and sustained emphasis on the value of non-pharmaceutical management strategies for various chronic health conditions. However, the health benefits were framed as the primary rationale for such interventions, and the environmental co-benefits were only briefly discussed during in-workshop and in-lecture discussions. For example, adopting a plant-based diet and walking or riding a pushbike to work or school (rather than driving) were recommended as effective non-pharmaceutical strategies for the primary and secondary prevention of cardiovascular disease in the PHR2142 (Comprehensive Care: Cardiovascular) unit. Teaching staff facilitated discussions as to the environmental benefits of these strategies, and students could include this in motivational interviewing roleplays. However, there is significant scope to further reinforce the positive environmental implications of non-pharmaceutical management strategies in written curriculum materials.*
- *The impact and benefits of benign by design pharmaceuticals through exploring medicinal chemistry concepts is covered in the PHR1222 How Medicines Work 4: Medicinal Chemistry unit.*

**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 earlier metrics, the PHR4012 (Professional Practice V) unit contains the optional topic 'Quality use of medicines and environmental sustainability'. This topic explores the environmental implications of pressurised metered dose inhalers (pMDIs), specifically focusing on the use of hydrofluorocarbons propellants as a contributing factor to global warming. Furthermore, the PHR2021 (How Medicines Work II) unit included several in-lecture and in-workshop verbal discussions as to the amount of waste generated by different pharmaceutical dosage forms (ie. single-use vials versus multi-use containers, daily tablets versus implantable devices, daily injections versus weekly injections etc.). However, such environmental implications were not included in any compulsory written coursework.*

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

3	Yes, there are clear and detailed strategies introduced for having conversations with patients about climate change in the core curriculum.
2	Yes, having conversations with patients about climate change is briefly mentioned in the core curriculum.
1	Yes, there are some examples of having conversations with patients about climate change in elective coursework.
0	No, there are not strategies or examples for having conversations with patients about climate change

*Score explanation: Throughout all Professional Practice and Comprehensive Care units of the degree, there was a sustained focus on communicating environmental health risks to patients. In the PHR2041 (Comprehensive Care: Gastrointestinal and Respiratory) unit, various written materials, case studies and role-play activities placed particularly strong emphasis on communicating the respiratory health effects of exposure to air*

*pollution. Students developed the skills to discuss air pollution as a risk factor/trigger for respiratory conditions such as COPD and propose appropriate management strategies (eg. smoking cessation, wearing PPE on construction sites etc.) in patient counselling sessions. However, the curriculum did not address strategies for communicating the connection between such environmental health risks and climate change. Thus, a score of 0 was awarded.*

**16. Does your pharmacy school curriculum guide students to consider the environmental impact of medications as a factor in addition to safety, efficacy, cost, and pill burden when comparing equivalent therapies?**

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

*Score explanation: As mentioned in earlier metrics, the optional topic 'Quality use of medicines and environmental sustainability' within the PHR4012 (Professional Practice V) unit contains explicit discussion as to the environmental impact of medications. Additionally, the PHR2012 (Professional Practice IV) unit provided an opportunity for students to consider pharmaceutical waste in addition to safety, efficacy, resource utilisation etc. when conducting cost-benefit analyses from the societal perspective. While this factor was not explicitly included in compulsory written coursework, it was briefly discussed during in-workshop lectures. Thus, a score of 1 was awarded.*

**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: During the latter months of the 2023 academic calendar, the Monash University Faculty of Pharmacy and Pharmaceutical Sciences became involved in the FMNHS Planetary Health Education project. This project is designed to “empower students and enhance educator capacity” for planetary health education, by supporting a team of self-nominated faculty educators and students to “reformulate existing learning and teaching materials to embody best-practice Planetary Health Education” (FMNHS Planetary Health Education, n.d.). Specifically, the team have designed a learning and teaching activity for implementation as part of the PHR3141 (Comprehensive Care: Pathogens, host defence and treatment) unit during 2024. Furthermore, planetary health was a recurring theme at the inaugural Pharmacy and Pharmaceutical Sciences Education Research Symposium, held on the 27<sup>th</sup> November 2023. A total of five sessions focused on sustainable healthcare, pharmaceutical waste disposal schemes, planetary health, and/or planetary health education.*

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

**4 Yes, there is/are a member(s) of faculty whose role is directly responsible for the incorporation of planetary health and sustainable healthcare as a theme throughout the curriculum**

2	Yes, there is/are member(s) of faculty who are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum as well as doing their principle role
0	There are no members of faculty who are incorporating planetary health and sustainable healthcare as a theme throughout the curriculum
<p><i>Score explanation: There are members of the Faculty of Pharmacy and Pharmaceutical Sciences who, throughout the 2023 academic year, have incorporated planetary health and sustainable healthcare as a theme throughout the pharmacy curriculum. In 2023, a faculty member was appointed as the Sustainability Lead for the pharmacy course, in addition to their principal role. Furthermore, as mentioned in earlier metrics, several faculty educators became involved in the FMNHS Planetary Health Education project during the latter months of the 2023 academic year.</i></p>	

<p><b>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?</b></p>	
3	There are multiple clinical practice experiences/placements that allow for direct exposure to planetary health topics.
2	<b>There is one available clinical practice experience/placement that allows for direct exposure to planetary health topics.</b>
1	There are available clinical practice experiences/placements that allow for indirect exposure to planetary health topics.
0	No, there are no such clinical practice experiences/placements available through the pharmacy school.

*Score explanation: As a member of PharmAlliance, the Monash University Faculty of Pharmacy and Pharmaceutical Sciences offers international student exchange opportunities in which students may participate in clinical practice experiences/placements. This allows for direct exposure to planetary health topics. As part of the exchange program, students participate in a research and education symposium with planetary health themes that include antimicrobial resistance and stewardship, infectious disease, non-communicable disease, nutrition and mental health.*

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

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

*Score explanation: The PHR4012 (Professional Practice V) unit contains an optional activity in which the disparity in the health effects of climate change are explicitly discussed. However, this topic is not outlined in compulsory coursework.*

**Section Total (35 out of 66)**

**53.03%**

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 with the broader institution. Interactions between health and the environment are complex and multifactorial. While climate change has been extensively studied from an environmental science perspective, planetary health is an emerging field. Pharmacy schools should support research in areas such as the health effects of climate change, adaptive measures and pharmacy's environmental impact.

<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 <b>or</b> healthcare sustainability.
2	<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.

*Score explanation:* In 2024, the pharmacy and pharmaceutical sciences faculty appointed Dr Suzanne Caliph as the Sustainability Lead for the Pharmacy course. Dr Caliph is an academic and lecturer conducting research within pharmacy education and primary care. 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’ in *Exploratory Research in Clinical and Social Pharmacy*. There is also a university wide approach led by Dr Liza Barbour who currently holds a Faculty Education Fellowship (2022-2024) where she is leading an interdisciplinary project to co-design planetary health curriculum with educators and students from various health professions at Monash University.

Additionally, there are faculty staff members with an interest in planetary health research and have published in the field. The publication is titled ‘*Achieving sustainable healthcare through deprescribing*. *Cochrane Database of Systematic Reviews*, 2022(10), [ED000159]. <https://doi.org/10.1002/14651858.ED000159>. There are also faculty staff who have signed up as Monash Sustainable Development Institute Affiliates. The program provides a three-year renewable membership offering benefits to both senior and early career researchers, education and professional staff by connecting, amplifying and growing sustainable development expertise across disciplines (Monash University, 2024)

**2. Has your institution recently provided extra curricular talks or learning opportunities on topics related to planetary health?**

4 **Yes, the pharmacy school has hosted at least one opportunity for extra learning on topics related to planetary health in the past year.**

3 Yes, the **institution** has hosted at least one opportunity for extra learning on topics related to planetary health in the past year.

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

*Score explanation: Insert explanation here.*

The ‘Human Health and Climate Change Virtual Exchange Program’ is available for 4<sup>th</sup> year pharmacy students who are interested in taking part in a Collaborative Online International Learning (COIL) experience. There are also faculty researchers who are co-investigators in the ‘Pharmacy, Environment and Climate Change’ survey. The research study seeks to better understand pharmacists' and pharmacy students' knowledge, attitudes, and behaviours related to climate change, environmental issues, and human health. Moreover, a university wide initiative is the Monash Sustainable Development Institute’s Sustainable Healthcare in Practice course where micro-credentialing is offered for practising health professionals including pharmacists.

**3. Is there a process by which communities disproportionately impacted by climate change and environmental injustice give input or make decisions about the research agenda at your pharmacy school?**

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



0 | There is no process, and no efforts to create such a process.

*Score explanation: Insert explanation here.*

Currently, there are faculty researchers who are co-investigators in the 'Pharmacy, Environment and Climate Change' survey. The research study seeks to better understand pharmacists' and pharmacy students' knowledge, attitudes, and behaviours related to climate change, environmental issues, and human health. Pharmacy students, pharmacists and academics can provide their input on climate change and environmental injustice through the survey.

**Section Total (8 out of 10)**

**80.00%**

## **Community Outreach and Advocacy**

**Section Overview: This section consists of an evaluation of pharmacy school engagement in relation to community outreach and advocacy efforts made towards mitigating planetary health and sustainability.** Through increased partnerships with various organisations, Monash has not only established some important industry relationships but has provided many opportunities for students to learn more about planetary health and sustainability. However regular commitment to planetary health education and sustainability is required to reach maximal impact. Thus, it is crucial for Monash to continue to collaborate with members of the community and various institutions. 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. Working together with local communities is the best way to evoke sustainable changes.

**1. Does your pharmacy school partner with community organisations to promote planetary and environmental health?**

3	<b>Yes, the pharmacy school partners with multiple community organisations to promote planetary and environmental health to share opportunities for student involvement.</b>
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.
<p><i>Score explanation:</i> The Monash Pharmacy school partners with various institution partners through sustainable programs such as ‘Green Steps’. This program is a five-day sustainability workshop run by the Monash Sustainable Development Institute who partners with organisations such as Enel Green Power. The workshops allow students to work on various projects and enable them to develop new skills. Upon the conclusion of the program, students will have developed a deeper awareness of planetary health and sustainability in general. Sustainability and planetary health is also explored within the Monash TeaMWork internship. In 2023, a ‘Sustainability in Pharmacy and Pharmaceutical Science Education’ working group was formed (with members from both disciplines, and support from the Monash Sustainable Development Institute), collaborating on embedding sustainability and planetary health across all courses in the faculty, and finding opportunities to share teaching and learning activities.</p>	

<b>2. Does your pharmacy school have coverage of issues related to planetary health and/or sustainable healthcare in their update communications?</b>	
2	Yes, all students regularly receive communication updates dedicated to planetary health and/or sustainable healthcare.

<b>1</b>	<b>Yes, planetary health and/or sustainable healthcare topics are sometimes included in communication updates.</b>
0	Students do not regularly receive communications about planetary health or sustainable healthcare.
<p><i>Score explanation:</i> Pharmacy students at Monash University receive occasional communications about planetary health or any form of sustainable initiatives via regular newsletters from the university which advertise educational sessions and workshops. These communications also inform students of various sustainable services on campus such as ‘Walk or Ride your Bike to School Day’ or ‘Reusable KeepCup’ services. Students also receive regular communication of sustainable training opportunities available within Monash such as the ‘Green Steps Program’. The coverage of planetary health issues and sustainable healthcare is set to increase as Monash Pharmacy plans to integrate planetary health within one of the 3rd year pharmacy curriculum units. Within Monash University, the Monash Institute of Sustainable Development runs workshops/webinars on sustainable healthcare, however promotion of these webinars should be optimised in order to increase student interest and engagement. Therefore, a score of 1 was awarded.</p>	

<b>3. Is your pharmacy school a member of a national or international planetary health or ESH organisation?</b>	
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>
<p><i>Score explanation:</i> The Monash University pharmacy and pharmaceutical sciences faculty has not taken part in the aforementioned organisations. However, the Monash Sustainable Development Institute which is part of the wider Monash University community is part of the Planetary Health Alliance. Therefore, a score of 0 was awarded.</p>	

<b>Section Total (4 out of 6)</b>	<b>66.7%</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.*

<b>1. Does your institution offer opportunities for pharmacy students to do research related to planetary health and/or sustainable healthcare?</b>
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2	The institution has a specific research program or fellowship for students interested in doing planetary health/sustainable healthcare research.
1	<b>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.</b>
0	There are no opportunities for students to engage in planetary health/sustainable healthcare research.

*Score explanation: Insert explanation here.*

Research projects focused on planetary health and sustainable pharmacy practice are available to 4<sup>th</sup> year students and 5<sup>th</sup> year interns. Research study project titles include: ‘Survey of Australian Hospital Pharmacists Adoption of Sustainable Practices’, ‘Pharmacy Students’ Perceptions on Environmental Sustainability in Pharmacy Education and Practice’ and pharmacy co-design opportunities for the innovative PHR3141 unit in collaboration with the Faculty of Medicine, Nursing and Health Sciences. While the school allocates inquiry projects to students, students may also reach out to the faculty to express their interest in a particular theme.

**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	<b>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.</b>
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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.
<p><i>Score explanation: Insert explanation here.</i></p> <p>Human Health and Climate Change Virtual Exchange Program is available for 4<sup>th</sup> year students interested in taking part in a Collaborative Online International Learning (COIL) experience.</p>	

<p><b>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?</b></p>	
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.
<p><i>Score explanation: Insert explanation here.</i></p> <p>Monash Association of Sustainability (MAS) primarily operates from the Clayton (main) campus while also maintaining connections with the Parkville pharmacy campus.</p>	

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

**1 Projects where students are able to gain experience in organic agriculture and sustainable food systems, such as gardens, farms, community supported agriculture (CSA), fishery programs, or urban agriculture projects.**

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

1 Events in which students learn directly from members of a local environmental justice community about the climate and environmental challenges they face, and how health professionals can partner with their community to address these exposures and impacts.

**1 Cultural arts events, installations or performances related to planetary health that have students as an intended audience.**

**1 Local volunteer opportunities related to building community resilience to anthropogenic environmental impacts.**

**1 Wilderness or outdoors programs (e.g., that organise hiking, backpacking, kayaking, or other outings for students)**

*Score explanation: Insert explanation here.*

Recognition is given to programs available institution-wide across all Monash University campuses. Whilst events centred on planetary health may not always receive widespread promotion, pharmacy students with an interest in these themes are encouraged to join student groups actively engaged in their advocacy. For instance, the Monash Permaculture Garden and University Community Farm host enriching activities that promote permaculture, sustainability, and gardening. Through the student club and University farm, students are able to gain experience in sustainable food systems, hear from experts and participate in local volunteering opportunities. Points are also awarded

according to the “Climate Notes” Monash University held in 2023. This was a multimedia art installation combining art and music performance to examine the global impact of climate disruption. Through this initiative, students participated in the cultural art event related to planetary health.

**Section Total (10 out of 12)**

**83.33%**

*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>	
<b>3</b>	<b>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.</b>
2	There is an Office of Sustainability with one or more full-time staff dedicated to campus sustainability, but no specific staff member in charge of pharmacy.
1	There are no salaried sustainability staff, but there is a sustainability task force or committee
0	There are no staff members or task force responsible for overseeing campus sustainability
<p><i>Score explanation: Insert explanation here.</i></p> <p>The ‘Buildings and Property Division’ at the faculty of pharmacy and pharmaceutical sciences have an established sustainability team. Monash University has a Buildings and Property Division sector which encompasses a sustainability team that manages Monash University as a whole. There is a newly appointed pharmacy course sustainability lead, Dr Suzanne Caliph, who is specifically responsible for sustainability initiatives and planetary health curriculum for the faculty.</p>	

**2. How ambitious is your pharmacy school/institution's plan to reduce its own carbon footprint?**

**4 The institution has a stated goal of carbon neutrality by 2030 or earlier and the pharmacy school has a well-defined and adequate plan in place to achieve this goal.**

3 Yes, there is a stated carbon neutrality goal by at least 2040 and the school has a well-defined and adequate plan in place to achieve this goal.

2 Yes, there is a stated carbon neutrality goal by at least 2040, but the pharmacy school has not created a plan to reach that goal or the plan is inadequate.

1 There is a CO2 emission reduction goal, but it is not one of carbon neutrality.

0 There is no stated goal for reduction of CO2 emissions.

*Score explanation: Insert explanation here.*

Monash University has made a commitment to achieve Net Zero emissions by 2030. Monash University works closely with industry, government and other research organizations to lead the way to global energy sustainability in the future. There is a well-defined and adequate plan in place to achieve this goal by 2030. In 2020, 45,000 LED light upgrades delivered \$2.4 million in energy avoidance. 12,000 solar panels were installed across all Australian campuses. In total, energy intensity was reduced by 24%. In 2022, Monash University commenced implementation of Monash-Engie Alliance to explore opportunities to co-develop scalable zero-carbon solutions. 2 electric bus chargers installed at the Clayton Campus bus loop. 55% of all energy requirements were supplied by renewable energy.

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

**2 Yes, the pharmacy school has both compost and recycling programs accessible to students and faculty.**

1 The pharmacy school has either recycling or compost programs accessible to students and faculty, but not both.

0 There is no compost or recycling program at the pharmacy school.

*Score explanation: Insert explanation here.*

*Yes, the pharmacy and pharmaceutical sciences faculty have both compost and recycling programs accessible to students and faculty members. Bio-chemical waste is also disposed of in an appropriate manner.*

**4. Does your pharmacy school provide paperless teaching? e.g. lecture materials, exam papers, hand-outs**

**3 The whole course is delivered using online modalities of assignment, lecture, and examination delivery.**

2 The majority of the course is delivered using online modalities with exception to few assignments where paper is still encouraged.

1 Some of the course is delivered using online modalities, but the majority of assignments and examinations are on paper.

0 None of the coursework is delivered using online modalities and paper printing is widespread.

*Score explanation: Insert explanation here.*

Throughout the pharmacy course, content is delivered through paperless teaching. This includes online lectures, reading materials, worksheets, workshop handout and lecture slides. During lectures, electronic powerpoints are used and students take notes using their electronic devices e.g. laptop or ipad. During face-face workshops, the use of table whiteboards are encouraged during collaborative learning as well as the use of cloud documents to enable collaborative work. Examinations are delivered online through the e-exam platform. The library also provides digital copies of books, journals and learning materials.

**5. Does your pharmacy school have programs and initiatives to assist with making lab spaces more environmentally sustainable?**

**2 Yes, the school has programs and initiatives to assist with making lab spaces more environmentally sustainable.**

1 There are guidelines on how to make lab spaces more environmentally sustainable, but not programs or initiatives.

0 There are no efforts at the school to make lab spaces more sustainable.

*Score explanation: Insert explanation here.*

On an annual basis, the sustainability team at the Buildings and Property Division run a program/initiative called 'Green Impact'. Staff/HDR students work together and form a workplace team to act on the list of items set out in the green impact toolkit. There is a section specifically dedicated to making lab spaces more environmentally sustainable.

**6. Does your institution have a strategy or timeline for divestment from fossil fuels?**

4	The institution has fully divested from fossil fuels
<b>3</b>	<b>Yes, the institution has solid divestment plans and a set timeline in which to divest by</b>
2	The institution has committed to divestment but does not have a set strategy or timeline
1	The institution has mentioned divestment but doesn't have a strategy or timeline
0	No, there are no plans nor mention of divestment from fossil fuels

*Score explanation: Insert explanation here*

Monash University has outlined on the university homepage that there is a specific plan and timeline to divest from fossil fuels, formalised in their first environmental, social and governance (ESG) statement. In the latest ESG statement, it is stated that since the commencement of an ESG working group, Monash University has confirmed that there are no direct investments with businesses who primarily produce fossil fuels. As outlined in the University's net zero initiative, energy use by all campuses, including the pharmacy and pharmaceutical sciences Parkville campus will be from renewable sources by 2030. As of 2022, 55% of the energy requirement supplied to Monash University is from renewable energy.

<b>Section Total (17 out of 18)</b>	<b>94.44%</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%

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

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

Section	Raw Score	Letter Grade
<b>Planetary Health Curriculum (59%)</b>	$(35 / 66) \times 100 = 53.03\%$	C
<b>Planetary Health Research (9%)</b>	$(8 / 10) \times 100 = 80.00\%$	A-
<b>Community Outreach and Advocacy (5%)</b>	$(4 / 6) \times 100 = 66.67\%$	B

<b>Support for Student-led Planetary Health Initiatives (11%)</b>	$(10 / 12) \times 100 = 83.33\%$	<b>A-</b>
<b>Campus Sustainability (16%)</b>	$(17 / 18) \times 100 = 94.44\%$	<b>A</b>
<b>Institutional Grade</b>	$(53 \times 0.59) + (80 \times 0.09) + (67 \times 0.05) + (83 \times 0.11) + (94 \times 0.16) = \mathbf{65.99\%}$	<b>B</b>

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