



Planetary Health Report Card:

Pharmacy

Keele University



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 CO₂eq per dose [5], whilst air pollution causes 7 million deaths per year worldwide and exacerbates chronic respiratory disease [6]. Pharmacy therefore has a direct and detrimental impact on planetary health and this contradiction in patient care must be addressed and actioned.

As future health professionals, we must be prepared to address the impacts of human-caused environmental changes on our patients’ health. This preparation is in the hands of the institutions providing our pharmacy training. It is imperative that we empower those who are educating pharmacy students about the health impacts of climate change and other anthropogenic environmental changes, generating research to better understand health impacts and solutions, supporting related student initiatives, embracing sustainable practices as much as possible, and engaging with surrounding communities that are most affected by environmental threats, and hold those who are not accountable. Because climate change and environmental threats disproportionately affect vulnerable populations [7] (for example, communities of colour, older adults sensitive to health threats, and individuals in low-resource settings), these issues are inherently ones of equity and justice.

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

Definitions & Other Considerations

Definitions:

- **Planetary Health:** is described by the *Planetary Health Alliance* as “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth” [1]. For example, topics such as climate change, declining biodiversity, shortages of arable land and freshwater, and pollution would all fall under the realm of planetary health. Both planetary health and traditional ‘environmental health’ examine the relationship between human health and the external environment, including extreme temperatures, chemicals, vector-borne diseases, etc. Planetary health explicitly concerns itself with the potential health harms associated with human-caused perturbations of natural systems. Therefore, the human health focus of planetary health makes the field well-adapted for the context of pharmacy school education. Throughout this report card, we use the term planetary health to refer to this broad swath of topics, but resources do not need to explicitly include the term “planetary health” to satisfy the metric.
- **Education for Sustainable Healthcare (ESH):** is defined as “the *process of equipping current and future health professionals with the knowledge, values, confidence and capacity to provide environmentally sustainable services through health professions education. We define a health professional as a person who has gained a professional qualification for work in the health system, whether in healthcare delivery, public health or a management or supporting role and education as ‘the system comprising structures, curricula, faculty and activities contributing to a learning process’* [8]. Planetary Health Education is an integral part of this education rather than an end in itself. This is because knowledge about planetary health is required to fully understand the necessity of sustainable healthcare. It is also part of the broader knowledge needed to fully protect and promote health.
- **Pharmacy School vs. Institution:** When “pharmacy school” is specified in the report card, this only refers to the curriculum and resources offered by the school of pharmacy and does not include offerings from other parts of the university (for example, undergraduate departments [USA], other related departments e.g. Public Health, Population Health departments). In contrast, when “institution” is specified in the report card, we are referring to the university more broadly. Any resource reasonably accessible by pharmacy students, no matter where in the institution the

resource comes from or if it is specifically targeted for pharmacy students, can meet this metric.

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

Summary of Findings

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>	

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.

Score explanation: Interprofessional education days where the pharmacy school partners with other schools of healthcare, such as medics and nurses and in doing so, one of the role-play activities is how to maintain delivery of healthcare services in the event of flash flooding and the additional injuries and infections as well as mental health issues that may come with this.

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.
<p><i>Score explanation:</i> An assignment within the 1st year requires students to complete an ecological survey on the area in which their lab is situated to determine the impact of an experiment on the local population and surrounding area to determine if they need to move lab locations. This is facilitated using a risk assessment.</p>	

<p>3. Does your pharmacy school curriculum address the health effects of pharmaceutical industry- and manufacturing-related environmental toxins?</p>	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation:</i> Throughout all labs, including doing our COSH forms, before to understand the hazards and precautions, such as whether it is harmful to the environment and how the materials can be disposed of responsibly. Within all labs, there is a focus on planning before the lab so that the lab proceeds safely but also to reduce the amount of unnecessary waste, such as using additional pipette tips and weighing boats because instructions were not</p>	

read or the use of additional material than what is required for the experiment. This is also looked at through the 1st year ecological survey.

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

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

Score explanation: The MPharm course does not look at the NHS overall carbon footprint as a whole but focuses on inhalers only and the impact of changing them to low carbon inhalers which is an NHS imitative.

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.
<p><i>Score explanation:</i> This is discussed in antimicrobial lectures in years 2 and 3. This is shown through 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.</p>	

<p>6. Does your pharmacy school curriculum address the respiratory health effects of climate change and air pollution?</p>	
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: Through discussions on the causes of COPD and asthma and how air pollution and the production of toxins from emissions from cars and cooking over fires can be a risk factor in causing COPD and triggering asthma attacks. With this, we have briefly seen how clean air zones for driving cars around Britain are meant to reduce the exposure and release of these carbon emissions

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

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

Score explanation: This is not currently taught within the pharmacy course

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.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation:</i> This is not currently taught on the pharmacy course	

9. Does your pharmacy school curriculum address the mental health and neuropsychological effects of environmental degradation and climate change?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<i>Score explanation:</i> This is looked at in an interprofessional day in which students look at the effects of mental health on people in the general area of a flash flooding and how health care professionals can support patients through this.	

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

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

Score explanation: The school, within the third year of pharmacy, looks at within the UK topics affecting public health, such as the north-south divide and the postcode lottery, to look at the different diseases that affect different areas and the different outcomes of treatment and treatment compared to different areas. This is then taken further with discussions about how disadvantaged groups will be more affected, such disadvantaged groups will have less green space and be in higher areas of pollution leading to higher rates of respiratory disease and exacerbations of asthma. Globally this is not covered.

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: This is not currently taught on the MPharm course.

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: Through the lens of health psychology and promoting healthy living to reduce the risk of conditions such as type 2 diabetes and high blood pressure as either a preventive in people at risk of these conditions or as part of a management plan for these conditions. So, although it is discussed it is done more so through the lenses of general healthy living advice.

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 counseling 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 fulfill this metric.
1	The health and environmental co-benefits of non-pharmaceutical management of conditions where appropriate such as exercise or yoga classes for type 2 diabetes; social group activities such as gardening for mental health conditions; active transport such as bicycle schemes for obesity. This is commonly known as social prescribing in the UK.
1	The impact and benefits of benign by design pharmaceuticals through exploring medicinal chemistry concepts and/or discussing implications of excretion of active metabolites/unchanged drug products on ecological systems

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

Score explanation:

This is covered by an option topic on sustainable pharmacy.

This is taught within the 2nd year, discussing how to dispose of controlled drugs safely. Most patients within the UK bring any leftover medication back to the pharmacy to be disposed of, including diabetic lancets, so there is not a specific focus on counselling patients on how to dispose of their medication. However, it is moving towards counselling patients where recycling points would be for over-the-counter medications such as syringes and blister packs.

This is looked at throughout all years of the pharmacy degree by looking at ways to reduce polypharmacy and optimise a patient's treatment. Through shared decision-making and the new medicines service, it ensures that patients are adhering to the medications that they are prescribed and, if they are not taking them, finding out the reasons why and potentially reassuring the patient, reducing medical waste in the patient not taking their medications.

This is taught throughout all years of the pharmacy degree. We are taught about social prescribing and how this can benefit different conditions such as fibromyalgia, a widespread chronic pain condition and how these groups can be tailored to the different abilities of patients and increase socialisation, which is important in reducing loneliness within the elderly community as loneliness can cause increased pain.

This is covered by an optional topic on sustainable pharmacy.

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.
<p><i>Score explanation:</i> In the 2nd and 3rd years, There are several different lectures that look at the use of different types of inhalers, how these can be changed from pMDIs to DPIs, and when this would be acceptable to change. This is also looked at in the sustainability of pharmacy which is an option topic given in the forth year of the MPharm course.</p>	

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.
<p><i>Score explanation:</i> Throughout all years of the course, we are taught how to converse with patients and build rapport with them through very brief advice and brief interventions with patients about different health concerns. Although this is not specific to climate change, this can be incorporated into the conversation.</p>	

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: Throughout all years of the pharmacy course when trying to reduce polypharmacy this is looked at through a lens of patient adherence to taking their medications and the environmental impact if the patient doesn't take their medication properly from the impact of making the medication to the impact of disposal and how lower the amount of medication a patient is taking can increase adherence whilst still treating the patient's condition. We also look at changing inhaler types. Within the UK, there is an aim to reduce the number of patients on pMDIs, which causes higher pollution.

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

Score explanation: The school is in communication with Trinity College Dublin, and the schools will collaborate on embedding the UN ‘Education for Sustainable Development’ goals into the pharmacy course on top of what is already discussed within lectures or on placements. This is being done following guidance from the environmental sustainability in pharmacy education created by the Sustainability in Pharmacy Education (SPE) Group.

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

Score explanation: Szu Shen Wong is the member of faculty who incorporates planetary health and sustainability into the curriculum.

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

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

Score explanation: Throughout all years of the pharmacy course, students are sent out on placement to community pharmacies for the first 2 years and then hospitals for the final 2 years, which can allow for exploration of planetary health topics. However, these changes are based on what students want to get out of placement and what the placement can provide. Planetary health topics are not a part of the workbooks.

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: Within health psychology and health inequality within the 2nd and 3rd years. This looks at different incomes and areas within the UK to allow for discussions about disadvantaged groups which have less green space and tend to live in areas of higher pollution, increasing rates of respiratory disease and exacerbations of asthma.

There are also discussions surrounding how flash flooding and extreme weather events such as heatwaves are more likely to affect disadvantaged groups, such as people living in high-rise flats and the extreme temperatures reached. Which can cause dehydration and heat stroke in both the elderly and young children.

Section Total (38 out of 66)	57.58%
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Are there additional curriculum resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below

Planetary Health Research

Section Overview: *This section evaluates the quality and quantity of planetary health research at the school and with the broader institution. Interactions between health and the environment*

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

1. Are there researchers engaged in planetary health research and healthcare sustainability research at your pharmacy school?	
3	Yes, there are faculty members at the School of Pharmacy who have a primary research focus in planetary health or healthcare sustainability.
2	Yes, there are individual faculty members at the School of Pharmacy who are conducting research related to planetary health or healthcare sustainability, but it is not their primary research focus.
1	There are planetary health and/or healthcare sustainability researchers at the institution, but none associated with the pharmacy school.
0	No, there are no planetary health and/or healthcare sustainability researchers at the institution or pharmacy school at this time.
<p><i>Score explanation:</i> This has not been done within the pharmacy school yet, they are looking at ways to do this though. There are however events put on for students, centred on sustainability such as in 2021, the Society for Academic Primary care Conference was hosted virtually by Keele University. Which had sustainability in healthcare as its theme. Students enrolled on BSc programmes within the school have the opportunity to enrol upon one of the seven Global Challenge Pathways at Keele, two of which are relevant here: Global Health Challenges, and Climate Change and Sustainability.</p>	

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

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

Score explanation: This has not been done within the pharmacy school yet, they are looking at ways to do this though. There are however events put on for students, centered on sustainability such as in 2021, the Society for Academic Primary care Conference was hosted virtually by Keele University. Which had sustainability in healthcare as its theme. Students enrolled on BSc programmes within the school have the opportunity to enroll in one of the seven Global Challenge Pathways at Keele, two of which are relevant here: Global Health Challenges, and Climate Change and Sustainability.

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

3	Yes, there is a process in which community members impacted by climate and environmental injustice have decision-making power in the climate + environmental research agenda.
2	Yes, there is a process in which community members impacted by climate and environmental injustice advise the climate + environmental research agenda.
1	No, but there are current efforts to establish a process for community members to advise or make decisions on the research agenda.
0	There is no process, and no efforts to create such a process.
<i>Score explanation:</i> No there is not currently a process for this.	

Section Total (3 out of 10)	30.00%
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Are there additional research resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.

Community Outreach and Advocacy

Section Overview: *This section evaluates pharmacy school engagement in community outreach and advocacy efforts associated with planetary health. Researching and teaching planetary health is necessary but not sufficient. It is critical that institutions also directly engage with communities most affected by environmental health harms. Although climate change is a problem largely created by those with power and resources, its impacts fall disproportionately on under-resourced populations and communities of colour. Institutions should partner with local communities affected by climate change and pollution to share information about environmental health threats, advocate together for change, and provide opportunities for students to be a part of this work.*

1. Does your pharmacy school partner with community organisations to promote planetary and environmental health?	
3	Yes, the pharmacy school partners with multiple community organisations to promote planetary and environmental health to share opportunities for student involvement.
2	Yes, the pharmacy school partners with one community organisation to promote planetary and environmental health to share opportunities for student involvement.
1	The institution partners with community organisations, but the pharmacy school is not part of that partnership.
0	No, there is no such meaningful community partnership.

Score explanation: The school of Pharmacy does not partner with any community organisations to promote planetary and environmental health. However, Keele University has a Sustainability Strategy which receives input from Trade Union Environmental Representatives.

Keele's Students' Union has collaborated with the National Union of Students to create an initiative called 'Student Eats' which allows students to grow their own food on campus (Student Eats, 2013).

Keele University works with the Carbon Literacy Project to provide students and staff with the opportunity to gain knowledge and awareness of the impacts of carbon dioxide and become certified as carbon literate (Carbon Literacy Project, n.d).

The Keele Wildlife Society has received bronze accreditation from the Hedgehog Friendly Campus, a scheme funded by the British Hedgehog Preservation Society, for their efforts in turning our campus into a safe habitat for Hedgehogs to thrive (Hedgehog Friendly Campus, n.d.).

Keele partners with the Trussell Trust, a local food bank, to donate non-perishable food items from students living in Keele's Halls of Residence at the end of each term (Recycling and Waste, no date).

Keele university uses Warp-it to exchange unwanted furniture with other staff members, this reduces waste and waste disposal costs (Recycling and Waste, no date).

Keele University works with the Soil Association to implement the Food For Life Catering Mark, an initiative that improves the sustainability of the catering at the University campus (Sustainable Food Policy, no date).

The Keele School of Pharmacy is currently in communication with a Public Health Officer for Stoke City Council with the intention of collaborating on green social prescribing and aging well initiatives.

Keele University helping prepare Staffordshire for net zero future:

Keele is working alongside Staffordshire County Council to help the county prepare for the opportunities of the transition to net zero future. This will be used to inform future decision making for investment and resource allocation to secure a skilled supply chain, ensuring that all stakeholders can make the most of the economic benefits of the transition.

This project focuses on developing the underpinning knowledge to address challenges around current skills, capabilities and capacity, and local supply chains that will enable Staffordshire to decarbonise at the rate required to meet the UK's 2050 net zero target. "As well as creating a detailed "net zero supply chain" roadmap, demonstrating what needs to be done for the county to decarbonise, the researchers will also create an associated net zero skills road map and audit of existing net zero skills provision in the county, to identify not only what skills and businesses will be needed for the net zero transition, but to identify the current gaps in the county's portfolio. This will then be used to inform future decision making for investment and resource allocation to secure a skilled supply chain, ensuring that all stakeholders can make the most of the economic benefits of the transition." (sustainability newsletter, no date). Clean Energy Scheme Award category: Keele took top prize in the prestigious Clean Green Energy award which commends projects that "spearheading the clean energy industry and delivering significant carbon savings". "A significant part of the SEND project is the campus renewable energy park which is currently providing up to 50% of the campus' electricity from renewable sources, featuring 12,500 solar panels, two wind turbines, and an industrial sized battery for storing the energy ". The green energy Awards are led by the renewable energy strategist Regen that are determined by the global and national leaders in the industry of green energy. "The SEND project (ref. 32R16P00706) is part-funded through the European Regional Development Fund (ERDF) as part of the England 2014 to 2020 European Structural and Investment Funds (ESIF) Growth Programme and is available to ERDF eligible companies. The project is also receiving funds from the Midlands Engine."(Unilever-decarbonise news, no date).KEELE chemist embarking on multi-million-pound study to help Unilever decarbonise products: In Keele university, the researchers have started a new project with Unilever, maker of a few worlds' leading home care brands, to help decarbonise its portfolio of product such as cleaning products. (sustainability, no date). This year's Green Festival will be a mixture of in-person and online activities in celebration of sustainability, people leading in embedding sustainability across the university, and the key projects based on campus that are in efforts to engage the population with sustainability and reduce carbon emissions that have impact locally and nationally. This programme includes Climate Cafe, talks, social media takeovers with the students, sustainability interns, tour of new solar farm and gardening sessions. There will be a wide range of wellbeing activities and collaborations with Root and Branch, Residence life, Keele SU, Keele catering, the KPA, Arts Keele and Grounds. The library contributes with healthcare sustainability communication/updates by displaying a stand in the foyer of the library. Below are activities that inform students and staff about healthcare sustainability updates:

- An introduction to Keele's staff sustainability network

- Veg and vegan food sampling,
- Pollution stories with Dr Pawas Bisht storytelling for Environmental Change.
- Vegetarian + veg food sampling
- Drink Rinse Repeat challenge with sustainability intern, Ethan
- Wildlife Hide competition
- Sustainability Benchmark Audit Training for students
- Wildlife Hide competition
- Great Donate and clothes swap
- Climate crafternoon
- KPA quiz
- Hedgehog friendly campus
- Wildlife litter pick walk
- Zero Carbon Britain Innovation Labs workshop
- Climate cafe with sustainability intern, Abigail Sproston
- Low Carbon energy Generation Park Tour (Solar Farm)
- Campus Green Teams with Keele Grounds
- Food Waste action Stall with Saada Elmi, Keele SU Environment and sustainability part time officer
- Vegan Market
- Global Climate Strike #peopleNotProfit
- Students Eats Gardening Session
- Educate students and staff member: sustainability photo competition 2023

2. Does your pharmacy school have coverage of issues related to planetary health and/or sustainable healthcare in their update communications?

2	Yes, all students regularly receive communication updates dedicated to planetary health and/or sustainable healthcare.
1	Yes, planetary health and/or sustainable healthcare topics are sometimes included in communication updates.
0	Students do not regularly receive communications about planetary health or sustainable healthcare.

Score explanation: The Head of the School of Pharmacy and Bioengineering sends out a fortnightly newsletter called TGI Phriday to keep the students updated about upcoming events, research news and announcements. Issues related to planetary health/sustainable healthcare have been included in some of the newsletters. Issue no. 147 updated students about the Student Minds initiative - the University has received funding from the UPP Foundation for research into the impact of climate change on the mental health of students. Issue no. 146 updated students about the student-led initiative called Earth Stories. Issue no. 144 notified students about an upcoming Health and Sustainability Forum Event and the availability of the Carbon Literacy Training for all students.

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

1	Yes, the school is a member of a national or international planetary health or ESH organisation
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0	No, the school is not a member of such an organisation
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Score explanation: Keele School of Pharmacy is not a member of a national or international planetary health or ESH organisation. However, it does partake in an event that consists of both international and national students across different courses that solely focus on planetary health: the Green society, that has partaken in the green energy competition.

Section Total (2 out of 6)	33.33%
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Are there additional community engagement and advocacy resources offered at your pharmacy school or institution not yet asked about that you would like to describe? If so, please do so below.

Support for Student-Led Planetary Health Initiatives

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

1. Does your institution offer opportunities for pharmacy students to do research related to planetary health and/or sustainable healthcare?	
2	The institution has a specific research program or fellowship for students interested in doing planetary health/sustainable healthcare research.
1	There are research opportunities for students to perform research related to planetary health/sustainable healthcare but these require student initiative to seek these out and carry them out in their spare time.
0	There are no opportunities for students to engage in planetary health/sustainable healthcare research.
<p><i>Score explanation:</i> Potters Pharm is a mandatory project in Stage 1 of the MPharm degree with a section called the ‘ecological survey’. This requires students to carry out sustainability-related research.</p> <p>Students are also encouraged to participate in completing the planetary health report card which allows for research into what the school and university do for planetary health.</p>	

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

2	The pharmacy school provides specific information related to planetary health or sustainable healthcare that includes up-to-date information on relevant initiatives and contact information of potential mentors.
1	The pharmacy school provides some information on projects and mentors within planetary health and sustainable healthcare within the school, but it lacks key information.
0	There is no pharmacy school specific access to planetary health and/or sustainable healthcare projects or mentors.

Score explanation: The Head of School (Katie Maddock) does have a fortnightly pharmacy school newsletter with details of current initiatives and achievements in the pharmacy school. There hasn't been many updates in sustainable healthcare/planetary health but if there were to be any it would definitely be uploaded there & reach the majority of pharmacy students' attention.

Pharmacy society is a student-led society which again if there were any updates on sustainable healthcare projects would be uploaded on their instagram or WhatsApp group chat which would also reach the majority of pharmacy students.

There is also a Microsoft teams' channel which is called 'FMHS-MPharm Careers Zone', run by Karen Gunnell, a member of academic staff. This is centred on career and project opportunities both pharmacy and non-pharmacy related, these can include roles with supporting change for the climate crises.

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

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

Score explanation: There are no groups specific to the School of Pharmacy dedicated to planetary health or sustainability, but there are a number of student organisations in the university as a whole. Sustainability Society and the Sustainability Community are both open to pharmacy students and foster a culture of planetary health education. There does seem to be faculty support from the university for this.

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: Score explanation: Keele has an allotment scheme (for growing organic local food), Student Eats (another allotment scheme but a collaboration between Keele SU and National Union of Students' (NUS) to grow organic food), Edible Campus (a student-led campaign)

A number of events where students are the intended audience, centred on sustainability and/or related to Planetary Health. Details of all the recent events are on the Keele website.

There are several events in which students are encouraged to use creativity and involve the arts and music, such as Orchestra for the Earth, which includes a discussion on climate change run by academics, a sustainability and climate change photo exhibition and Earth stories film festival which shows stories that address climate change.

Project FLOURISH is an upcoming Keele University project that will use the current students and graduate talent pool to improve several areas of the local community (Newcastle-under-Lyme).

Mountaineering society/club offers several outdoor activities such as hiking and backpacking. It is also a student-led society.

Section Total (8 out of 12)	66.67%
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Are there additional student-led initiative resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.

Campus Sustainability

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

1. Does your university have an Office of Sustainability?	
3	Yes, there is an Office of Sustainability with multiple full-time staff dedicated to campus sustainability. If the Office of Sustainability serves the entire campus, there is at least one designated staff member for sustainability at the pharmacy school.
2	There is an Office of Sustainability with one or more full-time staff dedicated to campus sustainability, but no specific staff member in charge of pharmacy.
1	There are no salaried sustainability staff, but there is a sustainability task force or committee
0	There are no staff members or task force responsible for overseeing campus sustainability
<p><i>Score explanation:</i> The university has the Environment and Sustainability Steering Group (ESSG) that is made up of 14 different job titles and meets quarterly to discuss all the different ways sustainability can be integrated into the university (e.g. procurement through to curriculum). However, there is no designated staff member who serves the hospital or the School of Pharmacy and Bioengineering.</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: There is a Climate Action Framework that applies to the whole university (including the School of Pharmacy and Bioengineering), which aims to achieve Carbon Neutrality by 2030. The plan is well-defined and appears to be realistic and achievable.

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.
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1	The pharmacy school has either recycling or compost programs accessible to students and faculty, but not both.
0	There is no compost or recycling program at the pharmacy school.
<p><i>Score explanation:</i> The university provides recycling and food waste programs. The food waste collected in the university goes to an anaerobic digester which produces high quality soil and compost for farming as well as gas to be used as a more sustainable energy source. Excluding construction waste, less than 1% of the university's waste ends up in landfills.</p>	

<p>4. Does your pharmacy school provide paperless teaching? e.g. lecture materials, exam papers, hand-outs</p>	
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: Exams and lecture resources are all delivered using online modalities. Most assignments are completed electronically and are either submitted as Word documents or PDFs via a submission portal or delivered and completed on online platforms (e.g. PebblePad). Physiology lab workbooks, pre-lab work and COSHH forms must be printed and handed in as physical copies. Placement booklets are also printed and provided to students as paper copies.

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: There are not currently any programs or initiatives run by the university to make lab spaces more environmentally friendly. However, in labs run by the PhaB, there is a focus on students planning before the lab to reduce the amount of unnecessary wastes (e.g. using additional pipette tips and weighing boats because instructions were not read; the use of more material than what is required for the experiment). This is noted for students within the lab handbook.

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

4	The institution has fully divested from fossil fuels
3	Yes, the institution has solid divestment plans and a set timeline in which to divest by
2	The institution has committed to divestment but does not have a set strategy or timeline
1	The institution has mentioned divestment but doesn't have a strategy or timeline
0	No, there are no plans nor mention of divestment from fossil fuels
<p><i>Score explanation:</i> The university has committed to ensuring all investments align with their environmental, social and ethical values. They have ceased investing in fossil fuels amongst a list of other things and reinvested the money in sustainability.</p>	

Section Total (12 out of 18)	66.67%
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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 University of Keele School of Pharmacy

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

Section	Raw Score	Letter Grade
Planetary Health Curriculum (59%)	$(38 / 66) \times 100 = 57.58\%$	C+
Planetary Health Research (9%)	$(3 / 10) \times 100 = 30.00\%$	D
Community Outreach and Advocacy (5%)	$(2 / 6) \times 100 = 33.33\%$	D
Support for Student-led Planetary Health Initiatives (11%)	$(8 / 12) \times 100 = 66.67\%$	B
Campus Sustainability (16%)	$(12 / 18) \times 100 = 66.67\%$	B
Institutional Grade	$(58 \times 0.59) + (30 \times 0.09) + (33 \times 0.05) + (67 \times 0.11) + (67 \times 0.16) = 56.67\%$	C+

Everyone who has been mentioned in the report card has given consent for the name to be recorded.

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