



Planetary Health Report Card:

Pharmacy

Queen's University Belfast



**QUEEN'S
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BELFAST**

2023-24 Contributing Team:

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Summary of Findings

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

Statement of Purpose

Planetary health is human health.

The Planetary Health Alliance describes planetary health as, “a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth’s natural systems on human health and all life on Earth”[1]. This definition is intentionally broad, intended to encompass the multitude of ways that the environment can affect health, including water scarcity, changing food systems, urbanisation, biodiversity shifts, natural disasters, climate change, changing land use and land cover, global pollution, and changing biogeochemical flows. The health of humanity is dependent on our environment and our environment is changing rapidly and in disastrous ways. Although the World Health Organization has called climate change “the single biggest health threat facing humanity”[2] many pharmacy schools’ institutional priorities do not reflect the urgency of this danger to human health. Fossil-fuelled electricity and gas and medical or pharmaceutical products used in healthcare account for around 8% of the total global greenhouse gas footprint of healthcare[3] with pharmaceutical waste also providing a dangerous contaminant to our water systems [4]. Metered dose inhalers contribute 500g CO₂eq per dose [5], whilst air pollution causes 7 million deaths per year worldwide and exacerbates chronic respiratory disease [6]. Pharmacy therefore has a direct and detrimental impact on planetary health and this contradiction in patient care must be addressed and actioned.

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

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

Definitions & Other Considerations

Definitions:

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

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

Planetary Health Curriculum

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

1. Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems?	
3	This topic is explored in depth by the core curriculum.
2	This topic is briefly covered in the core curriculum.
1	This topic is covered in elective coursework.
0	This topic is not covered.
<p><i>Score explanation:</i> The impacts of extreme weather events on individual health or healthcare systems is not specifically addressed in the curriculum.</p> <p><i>Recommendation:</i> There could be incorporation of the impacts of extreme heat and extreme weather events possibly into cardiovascular and respiratory lectures within Level 2 and 3 of the 'Applied Pharmacology and Therapeutics Module'.</p> <p>A new compulsory workshop for Level 1 students addresses 'Sustainability and the United Nations Sustainable Development Goals' (SUNSDG). This involves a group exercise in which students look at a new drug under development for a chronic disease affecting people globally. The students are tasked with deciding what Sustainable Development Goals need to be considered to ensure sustainable production and roll out of the drug. The workshop covers what facilities need to be available on the ground in locations with poor access so that medicines can be delivered successfully to patients. There may be potential within this workshop to discuss the impact that extreme weather events could have on the roll out of the drug and could be included as part of this teaching.</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:

The module *Placements and Preparation for Professional Practise* in Level 2 and 3 addresses the environmental impact of medicines and medical devices through simulated scenarios. Students are taught how to dispose of medicines correctly to harness the co-benefits of reducing their polluting ecological impact while simultaneously maintaining patient/ health professional safety.

Throughout the MPharm pathway, students are shown in laboratory based learning as to where they can dispose of chemical material and waste properly to similarly prevent harmful pollution and mitigate safety hazards.

In teaching about the respiratory system in Level 2, a table containing information about the respective environmental impact of different types and brands of inhalers is made available to students. This helps to create an awareness of the inhalers' role in contributing to climate change and can help students to consider more climate friendly alternatives.

The Level 1 workshop (SUNSDG), considers the group exercise in which students look at a new drug under development for a chronic disease. The students are tasked with deciding what Sustainable Development Goals need to be considered in order to ensure sustainable production and roll out of the drug. They discuss the process of production, ethical global access and delivery on the ground, and debate how each step can be made more sustainable.

Recommendation: The School of Pharmacy should continue to integrate this topic longitudinally in the curriculum. There could be increased teaching on how other dosage forms of medication may enter the environment and a more in depth discussion on the resulting pollution and health impacts that this may have.

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.

Score explanation:

There is teaching presented in the module *Pharmaceutical Technology* in Level 3 that highlights processes of manufacture that are less environmentally friendly, but the health effects of the pharmaceutical industry and specific manufacturing related environmental toxins are not covered.

Students are encouraged to dispose of material correctly during laboratory class based learning, but this is not emphasized as an action to mitigate adverse health effects of toxins as a by-product of the process of manufacture.

The Level 1 SUNSDG workshop explores the sustainable roll out and production of a new drug. This learning however focuses on increasing discussion broadly as to how processes can be made more sustainable, rather than addressing the health effects of toxins as a by-product of manufacture of the pharmaceutical industry.

Recommendation: There could be increased emphasis placed on the health effects of pollution and an awareness created about specific toxins released within lectures covering manufacturing processes possibly in the module 'Pharmaceutical Technology'.

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 carbon footprint of the NHS is discussed in the module *Advanced Drug delivery* in Level 3 guided by information provided by the Royal Pharmaceutical Society in conjunction with teaching on inhalers.

The Level 1 SUNSDG workshop discusses briefly the need for systems to be more sustainable, and implies within this the need for healthcare systems to also improve.

Recommendation: There could be more longitudinal teaching incorporated into the curriculum on the environmental impacts of the NHS and a comparison made with other healthcare systems to highlight how improvements could be made.

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

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

Score explanation:

In Level 1 ‘Microbes and Medicines’ and Level 3 ‘Applied Clinical Pharmacology and Therapeutics’ modules, patterns of infection, increased antimicrobial resistance, antimicrobial stewardship and mechanisms of resistance are discussed in detail. The prescribing and deprescribing of antibiotics using current guidelines is addressed as a measure to reduce antimicrobial resistance. The importance of finishing a course of antibiotics to prevent antimicrobial resistance is also highlighted to students and it is expected that they counsel patients on this while on placement. This teaching is not however discussed in the context of climate change and its impact on the environment.

Recommendations: While covering the topics outlined above, it could be considered to discuss the role of climate change as a contributing factor for increasing patterns of infectious disease and antimicrobial resistance, in conjunction with how this can be effectively mitigated.

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:

Pollution from burning biomass is covered as a contributing factor towards the development of COPD in lectures addressing the respiratory system in Level 2.

Air pollution as a contributing factor for asthma attacks is also discussed within this lecture series, and the first death of a child with air pollution stated as a contributing factor by the coroner's report is highlighted.

As previously mentioned in question 2, a table containing information about the respective environmental impact of different types and brands of inhalers is made available to students to increase awareness about their effects in contributing to climate change.

Recommendation: The School of Pharmacy should continue to integrate this topic longitudinally throughout the course and could place further practical advice and emphasis on selecting the most climate friendly inhaler type when completing medication reviews or commencing a patient on a new treatment. It could be considered that the impact of pollution on the respiratory system be incorporated into respiratory learning in Level 1.

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:

The cardiovascular effects of climate change are not addressed in the curriculum.

Recommendation: Within teaching on the cardiovascular system, there could be incorporation of learning on climate change as a contributing factor towards cardiovascular health effects in for example modules 'How the Body Works' in Level 1 and 'Applied Clinical Pharmacology and Therapeutics' in Level 2 and 3.

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.

Score explanation:
The relationship between climate change and allergies is not addressed in the curriculum.

Recommendation: The link between climate change and allergies could be included in lectures covering allergy in the module 'Applied Pharmacology and Therapeutics'.

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.

Score explanation:
Mental health and neuropsychological effects of environmental degradation and climate change are not addressed in the pharmacy curriculum.

The Level 1 SUNSDG workshop touches on the importance of an awareness of mental health and the promotion of good mental health, however, this is not discussed in the context of climate anxiety or related neuropsychological effects as a result of environmental degradation.

Recommendation: This topic could potentially be covered by the Level 1 workshop or within another lecture or lecture series dedicated to 'Pharmacists and Climate Change/Sustainability'. Students could be prompted to consider the counseling of a patient who has experienced negative mental health as a result of the impacts of climate change. The role of the pharmacist in managing such health effects of climate change could be discussed.

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 Level 1 SUNSDG workshop discusses the Sustainable Development Goals and social inequality. The impact of climate change is also discussed within this session.

Recommendations: This Level 1 workshop could highlight unequal regional health nationally/globally more specifically as a potential result of climate change. It could be included within this discussion as to how marginalized groups are disproportionately affected and what negative health outcomes this may result in.

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 Level 1 SUNSDG workshop discusses the social determinants of health within the Sustainable Development Goals. A slide briefly mentions the effect of diet on the health of people and on the planet. The teaching does not however go into detail about the relationship between climate change and for example the reduced nutritional value of food and its impact on health outcomes.

Recommendation: There is teaching on the social determinants of health already incorporated into the curriculum in Level 1. This could be modified to include teaching on how climate affects food and healthcare availability as social determinants of health, and could highlight how this may negatively impact on patient outcomes. There could be more longitudinal teaching throughout the MPharm degree pathway on the relationship between climate change and the social determinants of health.

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:

As mentioned in 11 above, the Level 1 SUNSDG workshop discusses the effect of diet on the health of people and on the planet, but does not yet explore in depth what this consists of. There is further coverage of plant based and other nutrition currently being developed for Level 1 teaching and this is due to be included as a compulsory element in the curriculum once complete.

Recommendations: The environmental and health co-benefits of a plant based diet with an emphasis on reducing reliance on animal based or processed food could be taught under non-pharmacological methods to reduce risk factors for disease. The environmental advantage could also be outlined more clearly. Students could be taught how to help patients interested in adopting a more plant based diet find accurate guidance on nutritional requirements to promote best patient outcomes and prevent deficiencies. Counseling opportunities for students on this topic could be explored.

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:

Biopolymers are addressed in the module 'Pharmaceutical Technology' in Level 2 as a method to reduce the burden of single use plastics in industry.

Medicines optimisation and reducing waste generated by overprescribing or poor patient compliance is highlighted in the Entrustable Professional Activities (EPAs) completed during placement within the 'Placements and Preparation for Professional Practise' module in Level 3. The importance of counselling patients on bringing back medicinal products to the pharmacy for safe disposal is also outlined during this teaching.

Teaching in Level 2 and 3 on drugs which may impair circulation (e.g. beta blockers and diuretics) highlights that this could put patients at increased risk of overheating in circumstances of extreme heat.

The carbon footprint of anaesthetic gases is not covered by the curriculum.

The overprescribing of antibiotics is addressed in lectures discussing antimicrobial stewardship in Level 1 'Microbes and Medicines' and in Level 3 'Applied Clinical Pharmacology and Therapeutics' as a factor which increases infectious disease and antimicrobial resistance. The co-benefits of reducing waste while promoting patient health and safety is outlined to and discussed with students.

Benefits of healthy social practices and outdoor exercise are addressed in the module 'Clinical Pharmacology and Therapeutics' in Level 3 in the Cardiovascular Disease and Diabetes lecture series.

Recommendation: The School of Pharmacy should continue to integrate topics outlined above longitudinally in the curriculum. The impact on the environment of anaesthetic gases could be outlined in lectures addressing the use of anaesthetics. The module Pharmaceutical Technology could explore incorporation of 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 in Level 2.

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:

The benefits of biopolymers when compared with traditional plastics is discussed in the module 'Pharmaceutical Technology' in Level 2.

The benefits of reducing packaging and encouraging proper management of medicines to prevent wastage of out of date stock is also addressed in the modules 'Pharmaceutical Technology' in Level 2, and in 'Placements and Preparation for Professional Practice' in Levels 2 and 3.

The environmental harm caused by inhalers and the discontinuation of CFCs through policy change is discussed in Level 2 'Pharmaceutical Technology'. As previously highlighted, a table containing information about the respective environmental impact of different types and brands of inhalers is made available to students to increase awareness about their effects when making prescribing decisions.

Recommendations: The School of Pharmacy should continue to integrate the topics outlined above with a focus on increasing longitudinal incorporation throughout the curriculum. There could be increased teaching on how use of dosage forms other than inhalers may affect the environment and their impact on climate change could be outlined more clearly.

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.
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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:

The curriculum does not directly address having conversations with patients about climate change.

Recommendation: Simulated conversation with patients about climate change could be incorporated into the curriculum in the Level 1 SUNSDG workshop or in the suggested lecture series 'Pharmacists and Climate Change/Sustainability'. Such teaching could aim to outline and discuss with students the role of the pharmacist and multidisciplinary teams in participating in such patient interactions.

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:

Entrustable professional activity (EPA) forms to be completed on placement throughout the MPharm guide students to consider the environmental impact of the therapies prescribed and encourage students to check whether a more environmentally friendly alternative is available.

The table aforementioned containing information about the respective environmental impact of different types and brands of inhalers also helps students to consider the environmental impact of medications as a factor when comparing equivalent therapies.

Recommendations: There could be further emphasis on providing students with resources to assess the environmental impact of medicines. At present, students are asked to consider the impact of medication, but lack resources, except when it comes to inhalers as to how they can find climate friendly alternatives. Students make decisions based predominantly on the National Institute for Health and Care Excellence (NICE) guidelines and it can be difficult to find information while in placement scenarios on more environmentally friendly therapeutic options for patients that may be considered for use.

17. Is your pharmacy school currently in the process of implementing or improving Education for Sustainable Healthcare (ESH)/planetary health education?

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

Score explanation:

The pharmacy school has recently launched a Level 1 workshop that addresses ‘Sustainability and the United Nations and the Sustainable Development Goals (SUNSDG)’. This workshop, as discussed in sections above, encourages students to consider the environmental impact of the pharmaceutical industry alongside the other Sustainable Development Goals.

A number of academic staff from the School of Pharmacy are part of the Sustainability Education group, a body which operates throughout the UK to promote strategies for climate change mitigation within pharmacy education. Through recommendations from this group, academic staff are in the process of considering such suggestions as potential additions to the Queen’s MPharma curriculum. The school of pharmacy have disseminated their work on the curriculum via the Queen’s University of Belfast Centre for Educational Development (CED) and have written two letters for reflection on how the sustainable development goals and climate change can be appropriately incorporated within pharmacy learning.

Letter for reflection: S. Kelly, D. Corbett, M. Hall, L. Hanna

<https://pure.qub.ac.uk/en/publications/sustainability-in-pharmacy-education-embedding-the-sdgs-within-ta> [9]

Letter for reflection: R. Scott, M-C Kearney, S Haughey, B Girvin

<https://pure.qub.ac.uk/en/publications/a-qualitative-analysis-of-pharmacist-independent-prescriber-train> [10]

At present, nutritional benefits and risks to health and the planet are being developed for Level 1 teaching, and are due to be included in the curriculum once complete.

The school is also in the process of expanding its signposting to the SDGs through all teaching, by highlighting relevant SDG logos on relevant lecture slides presented throughout the MPharm degree pathway.

Recommendations: The School of Pharmacy should continue to incorporate longitudinal teaching on sustainable planetary healthcare throughout the MPharm degree pathway. More in depth teaching on this topic should continue to be considered by academics, through reflecting on what other universities find appropriate for enhancing sustainability learning in Pharmacy. The curriculum should continue to be updated to provide an education that will equip students to actively promote sustainable healthcare in their future professional roles. Collaboration with other schools of Health Science at Queen's could be considered, possibly to simulate how interdisciplinary healthcare teams might be able to operate sustainably in the future.

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

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

Score explanation:

Dr Steven Kelly is the UN Sustainability Champion of the School of Pharmacy who has recently incorporated the Sustainable United Nations and Sustainable Development Goals workshop as a compulsory element in Level 1 teaching. Since his appointment, the school has

also commenced a new initiative to increase the visibility of sustainable development in education throughout the MPharm degree pathway, to improve awareness of the SDGs.

Dr Vicky Kett is the Environmental Officer for the School of Pharmacy.

Both academics fulfil these roles alongside their other responsibilities in teaching and research within the school.

Recommendation: The School of Pharmacy could consider the possibility of approaching Queen's University to appoint a member of faculty whose role is directly responsible for the incorporation of planetary health and sustainable healthcare as a theme throughout the pharmacy curriculum if deemed appropriate.

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:

No clinical practice or placements are offered that allow for the exploration of planetary health topics.

Recommendations: The School of Pharmacy could consider the introduction of placement opportunities for students during or outside of the academic term to explore planetary health topics. A number of academic staff within the School are members of the Sustainability Education group, a body which operates throughout the UK to promote strategies for climate change mitigation within pharmacy education. There could be scope as members of this group to increase such placement opportunities for students and this could be further explored in the coming year.

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 disparity in the effects of climate change specifically addressing the impact in vulnerable groups is not discussed in the curriculum. There is teaching in the Level 1 *SUNSDG* workshop on outcomes for marginalised groups, however, there is little coverage of climate change specifically as a factor contributing to disparity.

Recommendation: The topic outlined above could be incorporated as foundation material into the suggested lecture series 'Pharmacists and Climate Change' or into the existing Level 1 SUNSDG workshop. An understanding of this could be important in comprehending a patient's background, and could help to refine a pharmacist's empathy when communicating with those impacted by climate change.

Section Total (27 out of 66)

40.91%

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></p> <p>Research outputs at QUB can be searched through the PURE online portal. https://pure.qub.ac.uk/ Searching via the term 'planetary health' gives a result of 246 research outputs, with 39 student theses.</p> <p><i>Recommendations:</i> <i>The university should continue to support researchers undertaking projects with a focus in planetary health or healthcare sustainability and where possible, research within the school of Pharmacy on such topics could be given more consideration.</i></p>	

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

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

Score explanation:

The Centre for Sustainability Equality and Climate Action (SECA) holds regular events, including :

- How to be an Academic in a World on Fire Talk and hands-on workshop (13/12/2023)
- Tracing the Prelives of Lithium (5/12/2023)

Additionally, on 30/01/24, the QUB Sustainability Team hosted a summit for students to voice sustainability concerns about education, food, travel and banking.

The Queen's Annual Sustainability Lecture, titled 'The Climate Crisis: Why we need to dig deeper' was held on 19/10/23 and SECA had its own annual sustainability lecture: 'Who owns the Future?' on 29/11/23

The Queen's sustainable construction conference will be held on 28/02/24.

A range of COP28 events were held at QUB from 30/11/23 to 12/12/23, including a mock COP and a panel discussion on the topic of 'Connecting Belfast: Transforming Travel'. This included a number of representatives from the Alliance Party, Federation of Small Businesses, QUB, Sustrans, Translink and the Department for Infrastructure and allowed for a varied discussion on sustainable transport within Northern Ireland and QUB outlining their Net Zero goal.

<https://www.qub.ac.uk/about/sustainability/talks-conversations/>

Similarly to last year, an event is being held in the Medical Biology Centre QUB building for the NI science festival about planetary health aimed at 10-14 year olds. It is an interactive simulation of a 2035 'Climate Emergency Department' at the Royal Hospital, where flooding, rising temperatures and higher levels of infectious diseases make treating patients in the ED more challenging. It is scheduled for 15/02/24 and 16/02/24.

<https://nisciencefestival.com/events/climate-emergency-department-2>

Although the most recent of these are not closely aligned with planetary health, it is clear that Queen's has regular, relevant events and encourages a cross-disciplinary approach to sustainability.

Recommendations: The pharmacy school hosts a conference on topics relevant to planetary health.

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

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

Score explanation:

The Personal Public Involvement Network in association with the Health and Social Care services engages with the public to discuss research agendas that may be taken forward. There is an emphasis on gathering patient feedback and discussing patient experience to direct new research in the School of Pharmacy, but this does not direct that input be received by those disproportionately impacted by climate change or climate injustice specifically.

The Centre for Sustainability Equality and Climate Action (SECA) at Queens has produced a report from the conference named "*What should Higher Education Institutions do about the Planetary Crisis?*". <https://www.qub.ac.uk/research-centres/SECA/MediaOutputs/Outputs/What%20should%20Higher%20Education%20Institutions%20do%20about%20the%20Planetary%20Crisis%20Event%20Report.pdf> . In this report are sections on "research as/for public good" and "research culture and academic practice". These sections encourage making planetary health research processes more open and "democratic", with collaboration encouraged from different communities (including refugee and immigrant communities) who are disproportionately impacted by climate change. While this report and conference has encouraged work towards including disproportionately affected communities, this has not filtered down to the level of the QUB pharmacy school yet. Future

work from this conference will hopefully improve QUBs pharmacy schools performance in this metric.

Recommendations: It should be a priority of Queen's University to introduce systems which assess which communities may be impacted by climate change and environmental injustice. Reports from SECA show there is more priority being directed towards this and could facilitate future processes in the pharmacy school which will allow such communities to give input on research.

Section Total (5 out of 10)

50.00%

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 Sustainability Team at QUB hosted a community litter pick in November alongside Orchardville Belfast, a local charity helping individuals with learning disabilities and autism. Furthermore, QUB partnered with the Royal Society for the Protection of Birds (RSPB) to host a presentation on the importance of supporting wildlife in the environment.
<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/SustainabilityCampaignsandEvents/>

QUB has hosted a variety of talks for students, staff and the community on sustainability. Previous discussions have focused on ‘Giving Psychology “Away” in a Climate Crisis’, ‘City Conversations: SDG Challenges for Belfast’ and ‘A Just Transition: Avoiding Agriculture vs Environment Divide in Ireland’. The ‘Sustainable Entrepreneurship Program’ has also been launched by QUB to allow participants to “merge business acumen with sustainable practices” (but this was “aimed” at student participation).
<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/GreenatQueensE-Zine/#d.en.1456890>
<https://www.qub.ac.uk/sites/inqubate/News/SustainableEntrepreneurshipProgramme.html>

The QUB Sustainable Healthcare Development Group (SHDG) team is organizing their annual ‘Climate Emergency Department’ with the medical school. This event is part of the NI Science Festival and hopes to highlight the effects of climate change on healthcare with multiple interactive roleplay scenarios. It is a free event for children and young adults within the community.

<https://nisciencefestival.com/events/climate-emergency-department-2>

The ‘Queen’s Biology Showcase’, hosted by the School of Biological Sciences in conjunction with the NI Science Festival, is also open to the public with discussion points on sustainable nutrition and the impact of climate change on disease transmission.

<https://nisciencefestival.com/events/queens-biology-showcase-3>

The university also hosts an annual sustainability lecture that is open to the public every year. This year’s speaker, Sir Jonathon Porritt, gave a talk entitled ‘The Climate Crisis: Why we need to dig deeper’. Furthermore, the Centre for Sustainability, Equality and Climate Action (SECA) hosted their annual sustainability lecture on ‘Who Owns The Future?’ by Professor Molly Scott Cato.

<https://www.qub.ac.uk/about/sustainability/talks-conversations/>

Recommendations: We commend the university’s community outreach to local charities regarding sustainability, but we would recommend more involvement from the pharmacy school. The pharmacy school could partner with local patient advocacy groups/charities to highlight the importance of planetary health and environmental risk factors to patient health.

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:

Email communications to students and staff members occasionally address sustainability updates; however this is usually to highlight initiatives that are happening in the broader institution rather than in the School of Pharmacy itself.

Recommendations: It could be considered to increase regular communication to students regarding planetary health and sustainability longitudinally throughout the MPharm pathway, so that information could be easily accessed by students who are interested in finding out more about such topics.

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

1	Yes, the school is a member of a national or international planetary health or ESH organisation
0	No, the school is not a member of such an organisation

Score explanation:

The school is not a member of such an organisation at school level.

Recommendation: The School of Pharmacy could review the significance of joining a national or international planetary health or ESH organisation and make an informed decision as to whether membership would enhance the schools objective of increasing sustainability within the school.

Section Total (2 out of 6)

33.33%

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></p> <p>The School of Medicine, Dentistry and Biological Sciences (SMDBS) runs a Masters of Public Health and Masters of Global Health.</p> <p>There are also an increasing number of MSc courses related to Sustainable Development appearing at Queen's. This includes MSc Leadership for Sustainable Development and MSc Leadership for Sustainable Development, both offered by the School of Biological Sciences. Both courses have a small group project, where students engage with a host organization across the year in a real-world project to promote sustainable development through experiential learning, action research and work-based placements.</p> <p>https://www.qub.ac.uk/about/sustainability/teaching/</p> <p>There is opportunity in Level 4 of the MPharm to study planetary health as part of a 4th year project but this research is not funded, and is only undertaken by students as part of their own completion of the MPharm degree pathway. The Planetary Health Report Card is an example of a non-academic research opportunity that can be undertaken by students in their own time.</p>	

Recommendation: Queen's University should continue to offer such programmes as highlighted above. Increased opportunities could be offered by the School of Pharmacy itself to students interested in exploring this area.

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 School of Pharmacy website includes information about what is being done within the School of Pharmacy to reduce its carbon footprint. It also signposts to a designated officer for more information. Although the page is presented well, it is not up to date and does not mention the environmental laboratory LEAF scheme.

The official Instagram account for Pharmacy at Queens occasionally posts sustainability related updates. It has highlighted awards won by academics for sustainability research and also signposts to the Pharmcast podcast, which has hosted two sustainability related talks.

Recommendations: The School of Pharmacy website to improve its system to provide up to date information on initiatives that the school is involved in. A link to the LEAF scheme could be embedded in the page, so that information can be accessed quickly about this important initiative. As the curriculum changes to incorporate more sustainability in its teaching, these changes could also be included in the website to increase visibility of the schools commitment towards making learning more sustainability focussed.

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

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

Score explanation:

The Sustainable Healthcare Development Group (SHDG) is a working group consisting of medical students, academics from across the SMDBS, the School of Pharmacy, researchers, the Estates' team and the Faculty Pro-Vice-Chancellor. This group is dedicated to promoting sustainability and climate action within healthcare-related degrees and the Faculty, with links with other Sustainability teams across the university including the Students' Union.

The Estates' Team have created a Sustainability Forum and Sustainability Network that is open to staff and students of the university. There are three formal Forum meetings each academic year, whilst the network is an informal Microsoft Teams forum where people can post information about various events, projects and research opportunities relating to sustainability and environmentalism. Two student members of the SHDG sit on two of the new managerial boards pertaining to Sustainability - the Sustainability Board and Sustainability Engagement Group.

Recommendation: Continue publication of the presence and work undertaken by the Sustainable Healthcare Development Group to continue fostering inter-faculty relationships and encouraging healthcare-aligned staff and students to get involved with planetary health.

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:

1. BT9 Elms Allotment: <https://www.qub.ac.uk/student-blog/accommodation/bt9-allotment.html>

Students living in student accommodation at Elms BT9 can get involved with their Student allotment. The allotment team provides free gardening sessions alongside the Conservation Volunteers on Wednesday afternoons, teaching students how to grow their own food and harvest food for the onsite community fridge. The allotment has also hosted cooking lessons for students using produce grown onsite. The SU group Handy Helpers offers numerous volunteering opportunities, including gardening and litter picking events, such as the Big Autumn Clean upheld on the 22nd November 2023: <https://qubsu.org/VolunteerSU/Opportunities/HandyHelpers/#>

The UPSURGE project, jointly led by Queen’s researchers and Belfast City Council’s climate unit, started in Belfast in early 2023. Nature-based solutions will be tested in five demonstrator cities across Europe to share learning and good practice on pollution alleviation, climate resilience and citizen health: <https://www.qub.ac.uk/News/Allnews/2023/UPSURGEprojectplansbegintotakeshape.html>

Students can also get involved in another project in Botanic Gardens by volunteering for Friends of the Fields. As part of Horizon’s UPSURGE project, Friends of the Field have co-designed a community garden with Belfast City Council and QUB: <https://friendsofthefield.co.uk/about>

Students of the School of Natural and Built Environment can get involved with The SUN also has links with community organizations including Belfast Hills Partnership, the Royal Society for the Protection of Birds (RSPB) and The Conservation Volunteers, allowing students to get involved with sustainability, environmental and conservation projects in the community: <https://qubsu.org/VolunteerSU/Opportunities/LocalOpportunities/#conservation-environment-1998426-1>
2. With the official launch of QUB’s NetZero Plan in November 2023, there have been several sustainability-themed talks across the university: TEDxQueen’s University Belfast series in June was entitled “Engineering our Sustainable Future”

(<https://daro.qub.ac.uk/Engineering-our-Sustainable-Future->) and had talks from various Schools from Chemical Engineering to Psychology; The Planning Society hosted Chris Bridgman in September 2023 at an event entitled “Greening the Rooftops” to discuss the benefits of blue, green and bisolar roofs

(<https://www.qub.ac.uk/events/whats-on/listing/innovationafterhoursgreeningtherooftops.html>). The NetZero Launch Event included a panel discussion on the plan itself and an inaugural Sustainability lecture, this year hosted by Sir Jonathon Porritt

(<https://www.qub.ac.uk/News/Allnews/2023/Queens-University-launches-Net-Zero-Plan.html>). Students have also been welcomed at various other panel discussions including “Circular Economy - Fantasy or Reality” (21/11/23), “Transforming Travel” (06/12/23) and Mock COP28 (30/11/23).

QUB hosted “Save Our Wild Isles: Food and Farming Conferences” alongside the Royal Society for the Protection of Birds (RSPB) Northern Ireland, Countryfile’s Tom Heap, and the National Trust to bring together farmers, policymakers, academics and industry to discuss the role of agricultural policy reform in the context of the climate crisis, enabling students to network with various experts in the agricultural and farming sectors

(<https://www.qub.ac.uk/schools/SchoolofBiologicalSciences/Events/SaveOurWildIslesFoodandFarmingConference.html>).

3. SECA hosted a public meeting on 02/10/23 in the Crisis at Lough Neagh following its toxic algae bloom earlier in the year. A diverse panel of speakers were involved in the event, including MLAs from various political parties, a representative from the Lough Neagh Partnership, a representative from the community group “Love our Lough”, Friends of the Earth NI and the Director of Ulster Angling Federation

(<https://www.qub.ac.uk/research-centres/SECA/EventsOpportunities/PublicmeetingonthecrisisatLoughNeagh.html>)

4. From the 2nd to the 6th of May 2023, staff, students, residents and volunteers from Forward South Partnership joined forces to tidy, paint and plant alongside University Square Mews to create a sensory garden and vibrant shared space at Queen’s Film Theatre. Experts from neighboring Schools, Art Society, and QUB’s head gardener transformed the community alleyway. The event resulted in a fantastic renovation and a new sense of community within the area:

<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/GreenatQueensE-Zine/>

In October 2023, SECA hosted two drawing workshops in Botanic Gardens and Redburn County Park. Senior Lecturer from Belfast School of Art, Daniel Shipsides, took small groups to these areas of the local natural environment to participate in a drawing workshop: <https://www.qub.ac.uk/research-centres/SECA/EventsOpportunities/DrawingasnatureworkshopBotanicGardens.html>;

<https://www.qub.ac.uk/research-centres/SECA/EventsOpportunities/DrawingasnatureworkshopRedburnCountryPark.html>

SU Volunteer has hosted several community events in the last year. The Big Autumn

Clean Up was held on the 22nd of November 2023 and brought together SU Volunteer, SU Community Engagement, and the Sustainability Team to join Orchardville Belfast, a local charity which helps individuals with learning difficulties, to collect waste around the student Holylands area. The following day, they teamed up with Positive Vintage to host a sustainable fashion workshop where students could enjoy styling and modeling themselves in secondhand outfits and engage in a discussion on vintage fashion and its impact on the environment:

<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/SustainabilityCampaignsandEvents/>

After the success of last year's event, the Sustainable Healthcare Development Group held four sessions of "Climate Emergency Department" as part of Northern Ireland Science Festival. This is an interactive simulation hosted by QUB InterSim designed to get our doctors of the future thinking about the impact climate change has on healthcare delivery and treatment. These sessions are on the 15th and 16th February 2024:

<https://www.eventbrite.com/e/climate-emergency-department-tickets-749820853357?utm-campaign=social&utm-content=attendeeshare&utm-medium=discovery&utm-term=listing&utm-source=cp&aff=ebdsshcopyurl>

5. The SU is a partner in several community projects. This includes the One Million Trees project by Belfast City Council, which aims to plant one million trees in Belfast by 2035. Staff and students at Queen's have multiple opportunities throughout the year to get involved with this and many other gardening projects overseen by the Gardening Team, On 10/10/23, the Sustainability Team, the Grounds and Gardening Team and SU Volunteer's Handy Helpers planted winter bulbs at Riddel hall to increase biodiversity in the area. The Gardening Team also work with several local schools to help enhance biodiversity in the city.

<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/Biodiversity/>

Staff and students can get involved with the UPSURGE project previously mentioned. The UPSURGE project has links to not only QUB and Belfast City Council but also local stakeholders including Friends of the Fields previously mentioned. The project will look at growing food on contaminated land:

<https://www.qub.ac.uk/News/Allnews/2023/UPSURGEprojectplansbegintotakeshape.html>

"Geography at Work" module, a programme which gives students real-world experience in applying their knowledge and research skills to problems confronting society. Projects undertaken as part of this module also allow civic organizations and community groups to tap into expertise provided by Queen's in addressing local issues. The current programme is running two relatable projects: one is with World Development and Relief, investigating hardship and hope for people in the global south, and another looking at geological sites in the Belfast Hills. Projects undertaken as part of this module have fostered strong community links with the likes of the Belfast Hills Partnership, Habitat for Humanity, Forward South Partnership, Mapping Urban Regeneration and many more: <https://www.qub.ac.uk/social-charter/SocialCharterNews/GeographyatWork2021.html>

6. There are several Clubs and Societies registered with the Students' Union which focus on wilderness and outdoor programmes. This includes the Mountaineering Club, Caving Club, Scout Network and QUB Climate Action Network. Further information about these Societies can be found on the QUBSU Website: <https://home.q-su.org/club-socs/>

Recommendations: QUB has dedicated substantial time and resources to fostering strong relationships with numerous community groups, and has provided many opportunities for students to get involved with these projects and schemes. We encourage the continued advertisement of these opportunities within the QUB and wider Northern Irish communities.

Section Total (11 out of 12)

91.67%

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></p> <p>The university has a Sustainability Board which is responsible for overseeing and monitoring the University's 2040 Net Zero commitment and also promote and embrace the Sustainable Development Goals across university wide activities. The Board meets quarterly to review the progress of the Universities Net Zero Plan. The board is joint chaired by Professor Michael Alcorn, Pro Vice-Chancellor of Strategic Projects and Sustainability, and Sara Lynch, Head of Sustainability. It consists of 7 academic staff nominees, 18 professional services nominees, 1 trade union representative and 3 student representatives. Sarah Lynch, attends the PHRC group meetings at QUB, along with the Medical Faculty, and is involved with regular discussions with both the students and staff from the school.</p> <p>The university also currently has an unpaid role (sustainability champions) appointed by or volunteered to represent their faculty in a university-wide sustainability network of individuals with a common aim to lead and create positive change in their own areas or work. They support the work of the Sustainability Board on a local level by; creating a culture of sustainability, hosting information events and ensuring engagement in Queen's wider sustainability programmes. They are mainly administrative and technical staff.</p> <p>https://www.qub.ac.uk/about/sustainability/contact/#queen-s-sustainability-board-1426795-2</p>	

Some faculties across Queen’s have explored employing a new paid role for a “sustainability champion”. This role would differ from the current advocating role as a volunteer sustainability champion and instead would consist of keeping an up-to-date sustainability page relevant to both the university and their faculties information portals. Other responsibilities would include meeting with the senior management teams to help facilitate and streamline the feeding down of changes and also liaising with other departments of the university. There is an aim to achieve a general framework for this role which can be implemented across various faculties of the university to create continuity across the various information portals. This new “sustainability champion” will have a different name so as to not create any confusion with the current sustainability champion.

<https://www.qub.ac.uk/directorates/EstatesDirectorate/SustainabilityatQueens/StaffProgrammesandInitiatives/#:~:text=Being%20a%20Sustainability%20Champion%20means,local%2C%20national%20and%20global%20level.>

****This new sustainability champion role does not yet exist and so there is no designated staff member in Pharmacy to represent the staff member.**

Recommendation: Encourage Queens to continue with the development of this new Sustainability champion role. Explore opportunities for a member of the School of Pharmacy to be in charge of Sustainability within the school.

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:

In 2010 Queen's University Belfast launched the Carbon Management Plan and reached 23% reduction in emissions. In June of 2023 QUB published the Net Zero Plan to achieve net zero greenhouse gas emissions by 2040. This plan was based on the 2018-2019 emissions of 105,430 tonnes of carbon dioxide equivalent for planning purposes. The new Net Zero Plan follows with the UK carbon targets based on the Climate Change Act of 2008 to achieve net zero by 2050, Northern Ireland Climate Change Act of 2022, Belfast Carbon Targets, and the Higher Education specific guidance of 2023 from the Alliance for Sustainability Leadership in Education. QUB has adopted the principles of avoidance, reduction, lower carbon alternatives, and offsetting in order to achieve net zero. The plan outlines the current progress made from the 2010 plan and what they plan to do to achieve their goal of net zero by 2040.

Find information about the Net Zero Plan here;

<https://www.qub.ac.uk/about/sustainability/files/Filetoupload,1870172,en.pdf>

The School of Pharmacy itself has struggled to set a school level carbon footprint as it is spread out over multiple sites. It has proven difficult to track usage.

Recommendations: We support the University's Net Zero Plan and would like the plan to be made more accessible to students and the community to ensure they adhere to their plan and can be held accountable. Additionally, elaborating on their commitment to embracing "Sustainable Development Goals" and more evidence on their plan to transition to a carbon neutral society.

The Plan does recognize that 80% of emissions are not within the direct control of QUB such as reliance on suppliers, infrastructure changes, the NI electricity grid, and energy security risks. However, they have not given suggestions on ways to circumvent this or combat these issues. 80% of the emissions being not within the university's control is a significant amount to disregard simply due to perceived lack of control. The university should provide reasoning for why this percentage of the emissions are not within their control.

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:

There is general waste, paper, aluminium and plastic recycling facilities throughout the school of pharmacy but no composting programs are currently available. There is a university-wide strategy as part of Queen's 2040 plan to divert waste from landfill. This plan aims to update the processes and systems to allow for access to composting bins throughout the university.

Recommendation: The School of Pharmacy could collaborate with Queen's university to introduce food compost bins to the school. A focus should remain on reducing the amount of waste going to landfill.

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:

Lecture notes and the majority of teaching material is supplied digitally to students via email or the online learning platform Canvas. Some class tests take place in computer laboratories online, but most formal exams are still completed on paper.

Recommendations: The school should continue to make the majority of learning materials accessible electronically for students. It could be considered that paper based learning be removed entirely from in person workshops. Students could instead be required to bring with them an electronic device through which they could view learning resources. This would be reasonable for most workshops, as the vast majority of students already use such devices for study during other formal teaching e.g. lectures, and wouldn't act as a barrier to their learning.

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.

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

Score Explanation:

QUB's first public action towards divesting from fossil fuels was in May 2017 when it announced intentions to divest from fossil fuel extraction and production companies by 2025, which was ushered and pushed by a two year long "Fossil Free QUB" campaign led by the QUBSU Climate Action Group.

The university's latest "Responsible Investment Policy" was approved on 15th December 2020. Within the policy "Environmental, Social and Corporate Governance (ESG)" factors and "Responsible Investment" are described as being important factors in investment decision making. In section 4.3 INVESTMENT Decisions the policy says, "the University has instructed its fund manager to take account of ESG considerations and provided that the effect is not materially detrimental to expected investment returns, the university will seek to transfer its indirect investments into funds which exclude companies involved in the extraction and production of fossil fuels by 2025." The policy is left open with soft edges and doesn't enforce complete divestment from fossil fuels to be made by 2025. Section 4.2 (Responsible Ownership) of the policy states that Queen's expect its fund manager will "act in a way that reduces and, ideally, eliminates corporate behaviour leading to environmental degradation [and] climate change". Queens have put the divestment policy at the discretion of their fund manager, BlackRock Investment Management.

For Queen's new Net Zero Plan investments come under their scope 3 emissions. The carbon impact of Queen's investments is not currently quantified in their carbon footprint baseline but is "an emerging area of focus". The new plan has 3 points on their approach to improving their responsible investments which involve; reviewing their terms of reference and membership of the investment committee, working with an independent advisor to improve their approach & updating their investment policy. Blackrock has created a carbon exposure index for portfolio holders; QUB's exposure index has reduced from 3.8% to 1.2% (2022-2023) which displays a decrease in carbon emissions associated with investments. Although these are positive signs the index doesn't reveal the true measurement of carbon emissions. Blackrock currently has 2050 outlined as its clear commitment date to achieving 'Net Zero' carbon emissions. It is necessary then that Queen's act proactively and make interventions to ensure they meet their predated target of Net Zero by 2040.

Responsible Investment Policy [Filetoupload,1011043,en.pdf \(qub.ac.uk\)](#)

Annual Report [annual-report-22-23.pdf \(qub.ac.uk\)](#)

Recommendations: We implore QUB to quantify their carbon footprint created from investment scope 3 emissions and proactively act to make policy changes that facilitate the achievement of their 2040 NET Zero target.

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 Queen's University Belfast School of Pharmacy

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

Section	Raw Score	Letter Grade
Planetary Health Curriculum (59%)	$(27 / 66) \times 100 = 40.91\%$	C-
Planetary Health Research (9%)	$(5 / 10) \times 100 = 50.00\%$	C
Community Outreach and Advocacy (5%)	$(2 / 6) \times 100 = 33.33\%$	D
Support for Student-led Planetary Health Initiatives (11%)	$(11 / 12) \times 100 = 91.67\%$	A
Campus Sustainability (16%)	$(12 / 18) \times 100 = 66.67\%$	B

Institutional Grade	$(41 \times 0.59) + (50 \times 0.09) + (33 \times 0.05) + (92 \times 0.11) + (67 \times 0.16) = \mathbf{51.18\%}$	C
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References

1. PLANETARY HEALTH - Planetary Health Alliance [Internet]. Planetary Health Alliance. 2022 [cited 24 February 2022]. Available from: <https://www.planetaryhealthalliance.org/planetary-health>
2. Climate change and health [Internet]. Who.int. 2021 [cited 24 February 2022]. Available from: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
3. Lenzen M, Malik A, Li M, Fry J, Weisz H, Pichler PP, Chaves LS, Capon A, Pencheon D. The environmental footprint of health care: a global assessment. *The Lancet Planetary Health*. 2020 Jul 1;4(7):e271-9.
4. Patel M, Kumar R, Kishor K, Mlsna T, Pittman Jr CU, Mohan D. Pharmaceuticals of emerging concern in aquatic systems: chemistry, occurrence, effects, and removal methods. *Chemical reviews*. 2019 Mar 4;119(6):3510-673.
5. National Institute for Health and Care Excellence, NICE encourages use of greener asthma inhalers [Internet]. NICE. 2019 [cited 24 February 2022]. Available from: <https://www.nice.org.uk/news/article/nice-encourages-use-of-greener-asthma-inhalers#:~:text=Metered%20dose%20inhalers%20have%20estimated,compared%20to%2020g%20in%20DPIs>.
6. Urgent health challenges for the next decade. World Health Organization. 2020.[cited 24 February 2022]. Available from: <https://www.who.int/news-room/photo-story/photo-story-detail/urgent-health-challenges-for-the-next-decade>
7. Thomas K, Hardy RD, Lazrus H, Mendez M, Orlove B, Rivera-Collazo I, Roberts JT, Rockman M, Warner BP, Winthrop R. Explaining differential vulnerability to climate change: A social science review. *Wiley Interdisciplinary Reviews: Climate Change*. 2019 Mar;10(2):e565.
8. Shaw E, Walpole S, McLean M, Alvarez-Nieto C, Barna S, Bazin K, Behrens G, Chase H, Duane B, El Omrani O, Elf M. AMEE consensus statement: planetary health and education for sustainable healthcare. *Medical teacher*. 2021 Mar 4;43(3):272-86.
9. Kelly, S., Corbett, D., Hall, M., & Hanna, L-A. (2022). Sustainability in pharmacy education: embedding the SDGs within taught programmes. *Reflections*, (33), 31-32.
10. Scott, R., Kearney, M-C., Haughey, S., & Girvin, B. (2022). A qualitative analysis of pharmacist independent prescriber training. *Pharmacy Education*, 22(6), 30. <https://doi.org/10.46542/pe.2022.226.134>

