



Planetary Health Report Card:

Pharmacy

University of Montana

Skaggs School of Pharmacy



2022 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 | B- |
|---------|----|

| Curriculum | C+ |
|--|----|
| <ul style="list-style-type: none"> The Skaggs School of Pharmacy includes planetary health in the curriculum in the P3 Pharmacy Ethics course, but it lacks integration in the rest of the curriculum. In first and second year, various concepts related to planetary health are discussed in lectures (e.g. plant-based diets, social determinants of health, social inequality and inequity, increasing rates of allergies and asthma, and pharmaceutical manufacturing processes) but the term is never defined or used. These concepts are presented in isolation of their downstream effects, be it positive or negative in relation to planetary health. There is also a lack of teaching about introducing conversations about planetary health and/or climate anxiety into conversations with patients. Recommendations: There are many areas of the curriculum where simply adding an explanation of the downstream or upstream effects of a concept would link it to planetary health (e.g. plant-based diets and their health AND environmental co-benefits; increasing rates of allergies and asthma due to worsening air quality/increasing smoke/emissions, and mitigation techniques like indoor air filters). It is important for pharmacy students to understand the environmental impacts of the healthcare system in the US as it relates to other healthcare systems worldwide. This could be discussed in Pharmacy Practice (Dr. Lisa Venuti's course where the various costs of global healthcare systems are compared would be a logical choice). Another area where it is vital to understand environmental impacts of global healthcare systems is antimicrobial stewardship. Increasing antimicrobial resistance secondary to pharmaceutical pollution and irresponsible manufacturing practices, and the inequitable distribution of these effects, should be discussed in the early stages of students' introduction to AMS due to the driving nature of these forces. Finally, strategies for having conversations with patients about planetary health, climate change, and climate anxiety could be introduced in pharmacy skills or care labs, or as an integrated studies case. | |
| Planetary Health Research | B- |
| <ul style="list-style-type: none"> The University of Montana Center for Environmental Health Sciences has a mission of advancing the knowledge of environmental impacts on human health, though this work is separate from the pharmacy program. Christopher Migliaccio, PharmD, PhD also conducts research within the Department of Biomedical and Pharmaceutical Sciences (BMED) to understand the unprecedented exposure the local population of Seeley Lake, Montana had during the record-breaking wildfire season of 2017. His lab is following these exposures to learn about the effects of wildfire smoke exposure on incidence of respiratory disorders in this population. Pharmacy students get direct exposure to his work during Pharmacy Practice P1 year. Recommendations: The Skaggs School of Pharmacy could partner with communities disproportionately impacted by climate change and environmental injustice (e.g. rural community and/or tribal leadership) to seek their input and ideas to start Planetary Health research initiatives at the pharmacy school. They could consider adding a survey on planetary health into the IPHARM program, for example. The pharmacy school could also create co-curricular Planetary Health events (such as an IPE event that features a Planetary Health theme and | |

speakers) to help familiarize students with PH and the research opportunities present.

Community Outreach and Advocacy

B

- The University of Montana's legacy of partnership with many nonprofits and tribal partners over many years has laid a strong foundation for the school of pharmacy to expand and promote their own partnerships. The pharmacy school has taken up this mantle recently through the offering of the Human Health and Climate Change and Planetary Health COIL electives. These courses expose students to multiple community organizations (Climate Smart Missoula, Montana Health Professionals for a Healthy Climate, and Families for a Livable Climate, among others), providing a strong network student involvement.
- **Recommendations:** We recommend the pharmacy school continue to offer the Human Health and Climate Change and Planetary Health COIL electives each year. We also recommend they integrate these community partnerships into the required curriculum (Service Learning Projects in Dr. Carter's Healthy People course for P1s would be one suggestion). Finally, since the pharmacy school is not an official member of an ESH organization (e.g. Practice Greenhealth or Health Care Without Harm), we recommend they seek official membership of such an organization.

Support for Student-Led Initiatives

A-

- The University of Montana supports student groups with efforts focused on climate change and planetary health issues. The Climate Response Club (CRC) and the Student Health Professionals for Healthy Climate (SHPHC) are the two organizations most directly involved with this work. Both organizations are officially recognized by the Associated Students of the University of Montana (ASUM, our student government body), receive funding from ASUM, and work closely with faculty members. In addition, ASUM Sustainability serves as a resource for students to promote, develop, and implement sustainability and climate change education efforts.
- **Recommendations:** The University and pharmacy school provide strong support for student-led initiatives. We recommend the pharmacy school continue to offer support to students interested in sustainable initiatives by offering the Human Health and Climate Change and Planetary Health COIL electives each year, as pharmacy students often receive their first exposure to climate issues as human and planetary health issues through these courses. Also, we recommend the pharmacy school consider promoting the SHPHC to incoming P1s so students can have the option to join and participate in these opportunities earlier in their pharmacy school journey.

Campus Sustainability

C+

- The University of Montana has a longstanding (14+ year) history of promoting sustainability efforts and activities on campus. During the Office of Sustainability's first several years they made significant strides toward making UM a more sustainable campus by aiming efforts at carbon neutrality, solid waste reduction, recycling, sustainability literacy, and student engagement. They utilize a holistic scoring tool known as the Sustainability, Tracking, Assessment, and Rating System (STARS) to track their progress on a yearly basis. Unfortunately, the University fell short of its initial ambitious goal of carbon neutrality by 2020 due to "external circumstances" including the erection of new

buildings, fluctuating staff and student census, and the energy portfolio of their utility provider, Northwestern Energy.

- **Recommendations:** We recommend ASUM Sustainability divide all University departments among their staff members so they may serve as a resource to those departments to promote sustainability in a campus-wide manner. We hope that through this targeted approach they can set an achievable goal for carbon neutrality in the future (2040 at the latest, ideally). Since the school of pharmacy does not have a program-specific composting program, we recommend starting one (this could be a joint effort between the Pharmacy and Physical Therapy schools since they share a lunchroom and the associated recycling bins). We also recommend the pharmacy school create incentives for students to use sustainable forms of transportation and/or offer options for students to attend classes remotely to help students reduce their transportation footprint. Similarly, we recommend they introduce sustainable guidelines for events. Finally, we recommend they continue to work toward making lab spaces more environmentally sustainable.

Planetary Health Curriculum

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

| 1. Does your pharmacy school curriculum address the impacts of extreme weather events on individual health and/or on healthcare systems? | |
|--|--|
| 3 | This topic is explored in depth by the core curriculum. |
| 2 | This topic is briefly covered in the core curriculum. |
| 1 | This topic is covered in elective coursework. |

| | |
|---|----------------------------|
| 0 | This topic is not covered. |
| <p><i>Score explanation: In the core curriculum, Pharmacy Ethics features two case studies for students to evaluate and discuss from ethical standpoints: one is related to wildfires in Montana and the other a destructive cyclone in India. There is an associated lecture that covers the concept of Disaster Ethics and highlights concepts such as resource stewardship and rationing care. In Public Health, one lecture focusing on pharmacy disaster preparedness illustrates impacts Superstorm Sandy had on pharmacy operations. In addition, the Allied Health & Health Sciences Department (AHHS) offers three planetary health-themed, co-convened undergraduate/graduate level elective courses that are team taught by Peter McDonough, M.S. (Director of Climate Studies Program), Dr. Hayley Blackburn, Pharm. D, BCACP, BC-ADM, assistant Pharmacy Professor. These courses are AHHS 491.80/AHHS 591.80 (Human Health & Climate Change), AHHS 491.81 (Planetary Health Virtual Exchange). In Human Health and Climate Change, there is one lecture focused on extreme weather, natural disasters, and disaster preparedness with topics including wildfires and landslides are discussed. Heat waves are discussed in detail in another lecture specifically in terms of health impacts for special populations (e.g. pediatrics).</i></p> | |

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

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|---|--|
| 3 | This topic is explored in depth by the core curriculum. |
| 2 | This topic is briefly covered in the core curriculum. |
| 1 | This topic is covered in elective coursework. |
| 0 | This topic is not covered. |
| <p><i>Score explanation: In the same Pharmacy Ethics lecture from question 1, environmental impacts from the pharmaceutical life cycle (development, production, distribution, prescribing, disposal) are discussed. This lecture also discusses a 2017 study of the Baltic Sea and cites a figure that in the US there are low levels of pharmaceuticals in 80% of rivers and streams tested. In addition, this topic is covered in lectures and class discussions in the elective courses AHHS 491.80/591.80 (Human Health & Climate Change) in the lecture titled "Healthcare System Impacts" including the Hyderabad Pollution Crisis and AHHS 491.80 (Planetary Health Virtual Exchange) at various times during lectures and discussions.</i></p> | |

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

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| 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 topic is covered in the lecture titled “Healthcare System Impacts” and class discussions in the courses AHHS 491.80/591.80 (Human Health & Climate Change). Waste products produced by each step of the manufacturing process for active pharmaceutical ingredients, consumables, delivery systems, and packaging are discussed. The massive shift of generic drug manufacturing to China and India in the early 2000s and the resulting issues of minimal regulation, oversight, and transparency are discussed. The issues are also discussed through the lens of growing antimicrobial resistance.

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

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

Score explanation: In the same lecture from Pharmacy Ethics referred to in questions 1 and 2, one slide examines the US health sector's carbon footprint and global carbon emissions including as they relate to that footprint as well as GDP. China's health care carbon footprint broken down by sector is also presented. This topic is also covered in lectures and class discussions in the elective course AHHS 491.80/591.80 (Human Health & Climate Change). In particular, it is covered in the “Healthcare System Impacts” lecture and a lecture given by Dr. Elizabeth Schenk devoted exclusively to obstacles to and opportunities in green healthcare.

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

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| 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 the same lecture from Pharmacy Ethics referred to in questions 1, 2, and 4, an overview slide on global environmental change and human health with a CDC figure points lists antimicrobial resistance as a water quality impact. This topic is also covered in lectures and class discussions in the courses AHHS 491.80/591.80 (Human Health & Climate Change). Two class lectures are devoted to the topics of infectious diseases. Guest speaker Dr. Manuel Aravena discussed increases in infectious diseases amidst climate change and bats as disease hosts, while Dr. Curtis Noonan (University of Montana Public Health professor) discussed vector-borne diseases and pandemics.

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

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

Score explanation: In the COPD learning module in Therapeutics (P3 fall), the Global Initiative for Chronic Obstructive Lung Disease (GOLD) pocket guideline discusses indoor and outdoor air pollution as possible causes of COPD. It also lists environmental factors like air pollution as possible exacerbation triggers. Air pollution is listed as a cause for asthma in Dr. Kendra Procacci's asthma lecture in this course as well. During P1 year Christopher Migliaccio, PharmD, PhD covers his work with the SSOP's IPHARM (Improving Health Among Rural Montanas) program to understand the unprecedented

exposure the local population of Seeley Lake, Montana had during the record-breaking wildfire season of 2017. His lab is following these exposures to learn about the effects of wildfire smoke exposure on incidence of respiratory disorders in this population. This topic is also covered in lectures and class discussions in the elective courses AHHS 491.80/591.80 (Human Health & Climate Change) with a focus on Montana. In AHHS 491.80 (Planetary Health Virtual Exchange) the respiratory health effects of climate change and air pollution and potential solutions to address them in Montana and Australia are explored by Team Air Quality.

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

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

Score explanation: In the same lecture from Pharmacy Ethics referred to in questions 1, 2, 4, and 5 there is a slide titled Temperature Extremes that displays a graph with data from the 1995 Chicago Heat Wave. This topic is also covered in lectures and class discussions in AHHS 491.80/591.80 (Human Health & Climate Change) in which Dr. Robert Byron, devotes a lecture to the physical health impacts of climate change, including cardiovascular health impacts. In AHHS 491.80 (Planetary Health Virtual Exchange) the cardiovascular health effects of climate change and extreme heat and potential solutions to address them in Montana and Australia are explored by Team Extreme Heat.

8. Does your pharmacy school curriculum address the relationship between climate change and allergies?

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| 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. |

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|---|----------------------------|
| 0 | This topic is not covered. |
| <p><i>Score explanation: This topic is briefly covered in several lectures and class discussions in the elective course AHHS 491.80/591.80 (Human Health & Climate Change) including Physical Health Impacts by Dr. Robert Byron (compares grains of pollen per cubic meter from 2000 to the level predicted in 2040) and Environmental Justice by Dr. Robin Saha. In AHHS 491.80 (Planetary Health Virtual Exchange) the relationship between climate change and allergies is implicated for Team Air Quality.</i></p> | |

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

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| 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: This topic is covered in a two-part lecture series by Jen Robohm and in the elective course AHHS 491.80/591.80 (Human Health & Climate Change). It is also addressed in AHHS 491.80 (Planetary Health Virtual Exchange) in the Climate Change 101 lecture series by Peter McDonough and is a recurring theme during class discussions.</i></p> | |

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

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|---|---|
| 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: This topic is covered in lectures and class discussions in the elective course AHHS 491.80/591.80 (Human Health & Climate Change) in which topics related to the impacts social inequalities via climate change are woven into course lectures covering the topics of food security, Native American health, children's health, vector-borne illness, pandemics, and human migration and global health. In AHHS 491.80 (Planetary Health Virtual Exchange) case studies detailing impacts of climate change nationally and globally are regularly introduced. This course features collaboration between students at the University of Montana and Monash University in Australia. Therefore, a regular piece of this course is differential impacts of climate change at various locations across the globe.

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

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|---|---|
| 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 topic is a key theme covered in multiple lectures, reading materials, and class discussions in the elective course AHHS 491.80/591.80 (Human Health & Climate Change). In AHHS 491.80 (Planetary Health Virtual Exchange) the relationship between climate change and social determinants of health is implicated for all teams: Team Food Systems, Team Extreme Heat, and Team Air Quality.

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

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|---|---|
| 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: In Dr. Sarah Miller's Healthy Heart Diet lecture in Therapeutics I (P2 Spring) the Mediterranean, Ornish, and Portfolio Diets are introduced (these are all plant-based diets), however they are not linked to environmental co-benefits. In the elective courses Human Health & Climate Change and Planetary Health Virtual Exchange the environmental co-benefits of a plant-based diet are discussed by Peter McDonough.

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

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| 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 |

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

Score explanation: (Interpreting this question in relation to the core pharmacy curriculum only): one lecture (Climate, Environment, Human Health) in Pharmacy Ethics touches on the highlighted topics. “Cradle to the Grave” Pharmaceutical Stewardship is a concept that highlights the reduce, reuse, recycle, reclaim, remove hierarchy.

Prescribing/dispensing practices and drugs with improved bioavailability are examples of methods to reduce. Recovery of usable compounds, medical donation programs, and reusable devices and packaging are examples of methods to reuse. Recycling packaging materials and reprocessing unwanted drugs are examples of methods to recycle. Drug take back programs and reclamation of discarded pharmaceuticals are examples of methods to reclaim. And improved wastewater treatment and chemical transformation methods are examples of methods to remove. Another slide shows a chart with recycling options for different inhaler types. Also in this lecture discusses the carbon footprint of anesthetic gases desflurane (1 hr of desflurane = driving a modern car for 230 minutes) and nitrous oxide, compared with sevoflurane and isoflurane.

14. Does your pharmacy school curriculum discuss the environmental implications of various dosage forms, medication delivery devices, and/or excipients?

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

Score explanation: In Pharmacy Ethics, MDI and DPI are compared in terms of GHG emissions. Replacement of 10% of MDI with DPI would reduce CO2 emissions by 58 kilotons. Also, inhalers are compared in terms of recyclability. In the Climate Change and Human Health elective, environmental impacts of the pharmaceutical life cycle discusses preparation of product forms and manufacture of drug delivery systems (e.g. syringes, syringe drivers, vaporizers) as parts of production that contribute to the overall production footprint. Also presented is a striking statistic that the pharmaceutical industry production footprint is 13% greater than the auto industry despite the auto industry being 28% smaller (and 55% higher emissions intensity during production).

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?

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

Score explanation: The Human Health and Climate Change elective course devotes one lecture to Climate Change and Health Communication (Dr. Jennifer Robohm). Strategies on how to discuss the "whys," "whos," "whats," "whens," and "hows" of climate change and how to apply those strategies to a patient case. Some key strategies highlighted are avoiding jargon, emphasizing solutions, avoiding judgement, and acknowledging ambivalence.

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?

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|---|---|
| 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 a consideration directly addressed in Therapeutics I-IV. This topic is touched upon in the Human Health and Climate Change elective with regard

to MDI versus DPI inhalers (replacement of 10% of MDI with DPI would reduce CO2 emissions by 58 kilotons) and packaging considerations (blister packaging versus bottles).

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: Dr. Hayley Blackburn (in collaboration with climate change leaders in various University departments) helped create and facilitate the inaugural Climate Change and Human Health course spring of 2021. Another new offering is the Planetary Health virtual exchange (inaugural course spring of 2022). Both courses are available as electives to pharmacy students. Prior to these courses, exposure to ESH and planetary health was limited to one lecture in the core curriculum in Pharmacy Ethics. The new courses have improved access to ESH/planetary health education in a major way.

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. Hayley Blackburn, Pharm. D, BCACP, BC-ADM, an Assistant Professor in the Department of Pharmacy Practice, is the primary faculty member working

to incorporate planetary health and sustainable health care as a theme throughout the curriculum. She is doing so in addition to other teaching, mentoring, and committee responsibilities.

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

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

Score explanation: Dr. Hayley Blackburn offers a Global Health APPE (PHAR 585) that provides exposure to planetary health topics.

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?

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|---|---|
| 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 topic is a key theme covered in multiple lectures, reading materials, and class discussions in the elective course AHHS 491.80/591.80 (Human Health & Climate Change). One lecture (Environmental Justice lecture by Dr. Robin Saha) introduces the concept of Cancer Alley and points out how historically, toxic waste facilities have correlated with the racial and economic status of surrounding communities. It is emphasized that populations most vulnerable are also the least responsible for GHG emissions. In AHHS 491.80 (Planetary Health Virtual Exchange) the relationship between climate change and social determinants of health is implicated for all teams: Team Food Systems, Team Extreme Heat, and Team Air Quality.

Section Total (37 out of 66)

56.06%

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: The Center for Environmental Health Sciences has a primary research mission of advancing the knowledge of environmental impacts on human health.</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: Aside from the Human Health and Climate Change and Planetary Health Virtual Exchange courses (which are offered within the pharmacy school curriculum), the Institution offers a Climate Change and Human Health in Montana self-paced online course through the Montana Public Health Training Center. The course is free and offers 10 hours of Continuing Education credits for nurses, pharmacists, and sanitarians. It is primarily targeted at practicing health professionals and health professions students.

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 Office of Sponsored Programs (OSP) administers institutional external funding to assure institutional research is in compliance with internal controls and regulations, including those regarding collaboration with Indigenous Peoples. Guiding principles include respect, cultural humility, transparency and accountability. Montana is home to seven federally recognized tribal entities and each tribal government has different requirements to conduct research on its lands. By complying with these policies and procedures, the input of these communities disproportionately impacted by climate change and environmental injustice is taken into account by researchers.

Section Total (6 out of 10)

60%

Are there additional research resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.

Community Outreach and Advocacy

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

information about environmental health threats, advocate together for change, and provide opportunities for students to be a part of this work.

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

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

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

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

0 No, there is no such meaningful community partnership.

Score explanation: The University of Montana is an integral part of the broad community with a longstanding tradition of engagement. So much so, their mission statement is to “educate competent and humane professionals and informed, ethical, and engaged citizens of local and global communities; and provide basic and applied research, technology transfer, cultural outreach, and service benefiting the local community, region, State, nation and the world.” The University of Montana devotes thousands of service learning hours to dozens of the community’s nonprofits and tribal partners each year. In addition, UM’s yearly Community Giving Campaign gives UM employees and faculty the opportunity to donate to local nonprofits. Some examples of those that promote planetary and environmental health include Garden City Harvest, the Missoula Food Bank and Community Center, and the Montana Food Bank Network.

Through the elective course AHHS 491.80/591.80 (Human Health & Climate Change), students are introduced to various organizations that promote environmental health including the Montana Health Professionals for a Healthy Climate (MHPHC), Climate Smart Missoula, and Families for a Livable Climate. Dr. Hayley Blackburn (an assistant professor in the pharmacy department) co-teaches the course and serves on the Board of the MHPHC. Students interested in becoming involved with the efforts of these organizations may do so by participating in a Research APPE experience or engaging in voluntary research efforts.

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. |
| <p><i>Score explanation: Weekly Pharmacy Phacts email updates sometimes include information regarding planetary health/sustainable healthcare topics in their updates. Examples include information regarding course numbers and descriptions for the elective courses AHHS 491.80/591.80 (Human Health & Climate Change) and AHHS 491.80 (Planetary Health Virtual Exchange) as well as opportunities to join/become involved in projects with the Student Health Professionals for Healthy Climate student group.</i></p> | |

| 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 |
| <p><i>Score explanation: The pharmacy school is not an official member of an ESH organization (e.g. Practice Greenhealth or Health Care Without Harm).</i></p> | |

| | |
|-----------------------------------|---------------|
| Section Total (4 out of 6) | 66.66% |
|-----------------------------------|---------------|

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: The SSOP offers a two-year postgraduate pharmacy fellowship program offering fellows the opportunity to collaborate with faculty on research projects as well as develop their own independent research. A current fellow is conducting research on vulnerable populations' existing opinions and attitudes on climate change and what sources of information inform them. Additionally, there are opportunities for pharmacy students to perform research related to planetary health/sustainable healthcare while completing their pharmacy APPEs if they arrange them ahead of time with a faculty mentor who is versed in these issues such as Dr. Hayley Blackburn (i.e. Research APPE). Students can also seek out and engage in these opportunities in their spare time at any point during the pharmacy program.</i></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: In the Pharmacy Ethics course in the core curriculum, Dr. Hayley Blackburn gives a lecture titled Climate, Environment, and Health. At the end of this lecture there is a slide that provides links to health care sustainability and resiliency resources (e.g. Yale healthcare sustainability and public health resources, Health Care Without Harm). There is no specific contact information for specific mentors provided directly, though a student would be able to elicit this information from the resources provided.

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 Student Health Professionals for Healthy Climate (est. fall 2021) is an officially-recognized student group working on a variety of planetary health and

environmental stewardship projects. The group is supported by Dr. Hayley Blackburn as our primary faculty advisor as well as other faculty in the Climate Change Studies and other University Departments.

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: I: The PEAS farm is the University's campus and community farm where students and interns across many programs of study grow produce for the community and Food Bank. Additionally, the Student Health Professionals for Healthy Climate are partnering with Soil Cycle, a local composting organization, for a tour and volunteer day (spring semester). II/III: The elective course AHHS 491.80/591.80 (Human Health & Climate Change) features lectures from various professionals and leaders within the planetary health and environmental justice fields (e.g. Dr. Elizabeth Schenk and the WE ACT PLEASE healthcare sustainability framework). V: The Student Health Professionals for Healthy Climate are partnering with Free Cycles, a local bicycle co-op/sustainable transportation nonprofit, and Home Resource, a zero-waste community sustainability center that focuses on repair and reuse of building and household materials, for a tour and volunteer day (spring semester). VI: The Student Health Professionals for

Healthy Climate's tour of local volunteer organizations takes place by bicycle so it also functions as an outdoor program

Section Total (10 out of 12)

83.33%

Are there additional student-led initiative resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.

Campus Sustainability

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

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

Score explanation: The University of Montana Office of Sustainability was established under the direction of UM leadership in 2008 with the hiring of two full-time staff members and has since expanded to three full-time positions. Volunteer and internship opportunities are offered to students as well as undergraduate and graduate courses in multiple academic programs that integrate sustainability literacy as a core concept. The Office of Sustainability has also published annual Campus Sustainability Report Cards since 2013. The Office of Sustainability has no direct faculty ties to any departments, including the Skaggs School of Pharmacy.

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. |
| <p><i>Score explanation: The University of Montana originally published its Climate Action Plan in 2010 with a stated goal of carbon neutrality by 2020. According to the annual Campus Sustainability Report Cards, the University of Montana made significant strides in achieving this goal through 2015 but starting in 2016, “external circumstances” including the creation of new buildings, fluctuating student and staff census, and the energy portfolio of our local utility provider, have changed that outlook. The Office of Sustainability states their continued advocacy for reduced carbon emissions but as of this point no update to the original Climate Action Plan or stated goal for the achievement of campus carbon neutrality has been provided.</i></p> | |

| 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. |
| <p><i>Score explanation: The University of Montana Office of Sustainability employs a full-time recycling coordinator responsible for coordinating recycling initiatives. The University as a whole provides both recycling and composting and estimates a total diversion of approximately one ton of solid waste from local landfills daily. Of the main classes of recyclables, only glass and some plastics are not currently accepted. Looking at the Skaggs School of Pharmacy specifically, a program-specific recycling program exists but composting is not currently available outside of the university-based framework.</i></p> | |

| 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. |
| <p><i>Score explanation: All lectures are presented via MS Powerpoint with slides/handouts available for student access via the course shells (Moodle). Exams are typically given in paper format primarily to minimize the potential for academic dishonesty that can arise when exams are given remotely (currently there is not an option for students to sit for exams in a non-remote format). The vast majority of assignments are expected to be completed and submitted electronically. Exceptions include lab and integrated discussion courses which employ paper worksheets for in-class quizzes and activities, and clinical pharmacokinetics since this is a hands-on mathematics course requiring complex mathematical problem-solving that must be completed by hand.</i></p> | |

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

| | |
|---|--|
| 2 | Yes, the school has programs and initiatives to assist with making lab spaces more environmentally sustainable. |
| 1 | There are guidelines on how to make lab spaces more environmentally sustainable, but not programs or initiatives. |
| 0 | There are no efforts at the school to make lab spaces more sustainable. |
| <p><i>Score explanation: The University has a Hazardous Waste collection program. Used lab chemicals that are no longer wanted but safe to use are distributed to other labs if needed through non-formal communications. Universal wastes such as used batteries, and fluorescent lamps are recycled. Reuse of chemicals is encouraged. Departments are encouraged to purchase only the amount of chemicals necessary and not stockpile or store additional chemicals.</i></p> | |

Section Total (8 out of 14)

57.14%

Are there additional sustainability resources offered at your school or institution not yet asked about that you would like to describe? If so, please do so below.

Grading

Section Overview

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

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

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

Planetary Health Grades for the University of Montana Skaggs School of Pharmacy

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

| Section | Raw Score | Letter Grade |
|---|----------------------------------|---------------------|
| Planetary Health Curriculum (30%) | $(37 / 66) \times 100 = 56.06\%$ | C+ |
| Interdisciplinary Research (17.5%) | $(6 / 10) \times 100 = 60\%$ | B- |
| Community Outreach and Advocacy (17.5%) | $(4 / 6) \times 100 = 66.66\%$ | B |
| Support for Student-led Planetary Health Initiatives (17.5%) | $(10 / 12) \times 100 = 83.33\%$ | A- |
| Campus Sustainability (17.5%) | $(8 / 14) \times 100 = 57.14\%$ | C+ |

| | | |
|----------------------------|---|-----------|
| Institutional Grade | $(56.06 \times 0.3 + 60 \times 0.175 + 66.66 \times 0.175 + 83.33 \times 0.175 + 57.14 \times 0.175) = 63.57\%$ | B- |
|----------------------------|---|-----------|

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