



CFMS HEART: National Report on Planetary Health Education 2019

Abstract

The Canadian Federation of Medical Students' Health and Environment Adaptive Response Task force (CFMS HEART) is a national group of students engaged in education and advocacy on planetary health, defined as the health of human civilization and the state of the natural systems upon which it depends. HEART has created a set of core competencies on planetary health with a goal of incorporating them into all Canadian medical school curricula. To track progress, Canadian medical students and faculty have completed the first national survey of planetary health teaching in undergraduate medical education. This informal survey explored the inclusion and quality of teaching on climate change and environmental topics, and opportunities for student engagement in and out of the classroom. Students and/or faculty from all 17 Canadian medical schools participated in the evaluation. Results show varying coverage of planetary health topics, from minimal to no teaching, to some lecture-, case-, or project-based teaching. Our qualitative analysis is summarized in nine key recommendations for faculty and learners.



Key Recommendations

1. Acknowledge students are learners with a vested interest in their own education and work with them in meaningful ways to improve planetary health teaching.
2. With student and faculty input, work to develop specific longitudinal learning objectives for engaging planetary health education throughout the duration of medical education.
3. Develop lecture-based, case-based, or project-based planetary health teaching that addresses the local health impacts of climate change and meets defined learning objectives.
4. Encourage students towards planetary health topics as a focus of community-based projects, research, or service learning opportunities.
5. Using available resources, such as the CFMS HEART Planetary Health Competencies, develop curricula that provides medical students with an understanding of local and national health impacts of climate and other environmental changes and ways that health professionals can address these.
6. Ensure curriculum distinguishes the field of environmental and occupational health from that of planetary health.
7. Acknowledging that time within medical curricula is precious and limited, incorporate planetary health teaching into existing or new sessions to provide students with an understanding of the multifaceted health impacts of climate and environmental changes and practical applications for physicians.
8. Support student initiatives to improve planetary health education and student advocacy efforts around the health impacts of climate change.
9. Acknowledge that physicians have a responsibility to model sustainable behaviour in their personal and professional lives, beginning as medical students.

Table 1: Summary of perceived strengths and areas for improvement based on survey responses

As described in the methods, the information in this table is based on feedback from one survey form per school completed collaboratively by as many medical students and faculty members as possible. As described in the limitations in Table 2, this information is based on our best efforts to collect as much feedback as possible; however, participation and sample size varied across schools, affecting the accuracy of the information presented. As this was our first evaluation attempt, it is possible that there are types of teaching that we were not able to capture in our evaluation, which, therefore, may not be reflected.

Legend:



= identified as present



= identified as excellent



= identified as an outstanding leader in planetary health education

Input			Highlights	
School	Student	Faculty	Strengths	Areas for Improvement
UBC	2	0	<ul style="list-style-type: none"> Air and water topics mentioned in 2x 15-minute lectures per year Active EnviroMed student group 	<ul style="list-style-type: none"> No faculty input in survey Scope for integration of case-based or non-didactic sessions Self-directed "FLEX" projects, limited supervisors focused on Planetary Health currently, but more being developed
U of A	3	2	<ul style="list-style-type: none"> 2-hour dedicated lecture for Y2 students on climate change 3-hour model WHO assembly, mandatory for Y1s, focused on climate change in 2019 Medical Students for Environmental Health volunteer group teaching impacts to children Sustainability Officer student role 	<ul style="list-style-type: none"> Scope for more integration in existing sessions/courses other than public health Student desire for more focused objectives and assessment
U of C	4	1	<ul style="list-style-type: none"> 2-hour dedicated lecture and 2-hour small group session in Y2 Active Environmental Health student interest group Connection and mentorship with CAPE-Alberta physician leaders Global health project Y2, students may choose a planetary health topic 	<ul style="list-style-type: none"> Scope for more integration in existing sessions/courses Scope for increased teaching on sustainable healthcare practices
USask	3	0	<ul style="list-style-type: none"> 2-hour lecture on environmental health in Y1 Medical students' society runs annual Earth Week events Intersectional environmental and patient health activism group formed during course of HEART evaluation, to incorporate the competencies 	<ul style="list-style-type: none"> No faculty input in survey Scope for integration of case-based or non-didactic sessions Scope for more integration in existing sessions/courses Scope for related research- or community-based project opportunities
U Manitoba	2	0	<ul style="list-style-type: none"> Extracurricular opportunities available through global health curriculum and interest group 	<ul style="list-style-type: none"> No faculty input in survey Scope for inclusion of specific teaching on planetary health topics. Prior session on One Health poorly received. Student desire for relevant, practical, engaging teaching Scope for creation of specific environmental student role or interest group
NOSM	1	0	<ul style="list-style-type: none"> 2-hour case-based learning session and research assignment on climate change and health in Y1 Integration of environment in existing lectures Good approach to climate change effects in Northern Ontario Extracurricular opportunities through global health committee 	<ul style="list-style-type: none"> No faculty input in survey Scope for inclusion of dedicated lecture on planetary health or climate change Student desire to learn about impacts beyond northern Ontario Scope for creation of specific environmental student role or interest group
Western	5	0	<ul style="list-style-type: none"> EARTH Club student interest group, strong student desire for teaching 	<ul style="list-style-type: none"> No faculty input in survey Scope for dedicated lectures or case-based learning sessions Scope for integration in existing sessions/courses Scope for related research or community-based project opportunities
McMaster	1	0	<ul style="list-style-type: none"> Some opportunities for related research projects or one-time extracurricular events 	<ul style="list-style-type: none"> No faculty input in survey Scope for inclusion of dedicated lectures or case-based learning sessions Scope for integration in existing sessions/courses Scope for creation of specific environmental student

				role or interest group
U of T	3	0	<ul style="list-style-type: none"> • Research/community project in Y2 (HSR/ICE), students may choose related topic • Student roles - Local Officer of Climate Change and Health, Greenmeds Co-directors 	<ul style="list-style-type: none"> • No faculty input in survey • Scope for inclusion of dedicated lectures or case-based learning sessions. Some topics tangentially mentioned in Social Determinants of Health curriculum
Queen's	7	2	<ul style="list-style-type: none"> • Lecture/case-based session Y1 on environmental/occupational health with mention of planetary health • Community-based project in Y1 that allows students to choose environmental organisation • Active environmental student interest group 	<ul style="list-style-type: none"> • Scope for more in-depth planetary health coverage and for integration in existing sessions/ courses
Ottawa	2	0	<ul style="list-style-type: none"> • Some objectives briefly addressed in lectures on other topics 	<ul style="list-style-type: none"> • No faculty input in survey • Scope for inclusion of dedicated lectures or case-based learning sessions • Scope for integration in existing sessions/ courses • Environmental student interest group not funded in 2019
McGill	2	1	<ul style="list-style-type: none"> • Brief mention in existing occupational health lectures 	<ul style="list-style-type: none"> • Scope for inclusion of dedicated lectures or case-based learning sessions • Scope for more integration in existing sessions/ courses • Environmental student interest group not funded in 2019
U de M	0	?	<ul style="list-style-type: none"> • Integrated in lecture and self-learning module on occupational and environmental health 	<ul style="list-style-type: none"> • No student input in survey • ASPIRE recognition for social accountability, but no specific mention of any student interest group
Laval	2	1	<ul style="list-style-type: none"> • 2-hour session in course on society and medicine • Integrated in some reflective questions in small group discussions • ÉCO, active student interest group 	<ul style="list-style-type: none"> • Scope for inclusion of dedicated case-based session • Scope for more integration in existing sessions/ courses
Sherbrooke	0	?	<ul style="list-style-type: none"> • Topics touched on in existing sessions/projects, at least 3-4x/year • Opportunities for students to engage in related community or research projects 	<ul style="list-style-type: none"> • No student input in survey • Scope for inclusion of dedicated lecture or case-based session on planetary health/climate
Dalhousie	11	2	<ul style="list-style-type: none"> • Thorough evaluation with input from multiple students & faculty • 1-hour lecture and 2-hour small group learning session in Y1 • Mandatory research (RIM) project, students may choose related topic • Student officer position for Environmental Health and Sustainability 	<ul style="list-style-type: none"> • Scope for and interest in integrating topics through existing Y1 and Y2 problem-based learning cases • Scope for increased teaching on sustainable healthcare practices
Memorial	2	1	<ul style="list-style-type: none"> • 1- or 2-hour lectures on disaster related risks and occupational/environmental health; topics touched on in other lectures • Mandatory research project with option to choose an environmental topic and available supervisors • Environmental student interest group 	<ul style="list-style-type: none"> • Scope for inclusion of dedicated case-based session • Recent decrease in curricular time spent on environmental health • Scope for increased teaching on sustainable healthcare practices

*A question mark indicates that respondents did not indicate the number of people who contributed to their school's survey.

Planetary Health Curriculum Components							
School	Learning Objectives	Longitudinal Integration	Lectures	Problem-Based Learning	Reflection-Based Learning	Assessment	Extracurricular opportunities
UBC	✓	✓					✓
U of A	✓	★	★	★			★
U of C	✓	✓	✓	★			★
USask	✓	✓	✓			✓	✓
U Manitoba			✓				★
NOSM	✓	✓		✓	★	★	★
Western							★
McMaster			✓				✓
U of T		✓		✓			★
Queen's	✓	✓	✓	✓			★
Ottawa				✓			
McGill							
U de M	✓	✓	★	★	✓	★	★
Laval	★	★	★		✓	★	★
Sherbrooke	★	★		★	★	★	★
Dalhousie	✓	✓	✓	✓		✓	✓
Memorial	✓	✓	✓		✓	✓	★

Introduction

Climate change and other rapid environmental changes are already impacting Canadians' health [1]. On July 17, 2019, the Canadian House of Commons declared a national climate emergency. Already, Canadians have experienced the impacts of temperatures that are rising at twice the rate of the global average [2], such as increasing incidence of natural disasters, including floods, forest fires and extreme, deadly heat waves, and spread of disease vectors, including Lyme disease [1]. Given increasing impacts on Canadians' health, physicians must be prepared to address the health-related consequences of a climate-changing Canada. As the physicians of the next generation, today's medical learners are conscious of the need to both prevent the worst harms to the ecological determinants of health, and to adapt health systems to planetary risks that cannot now be avoided.

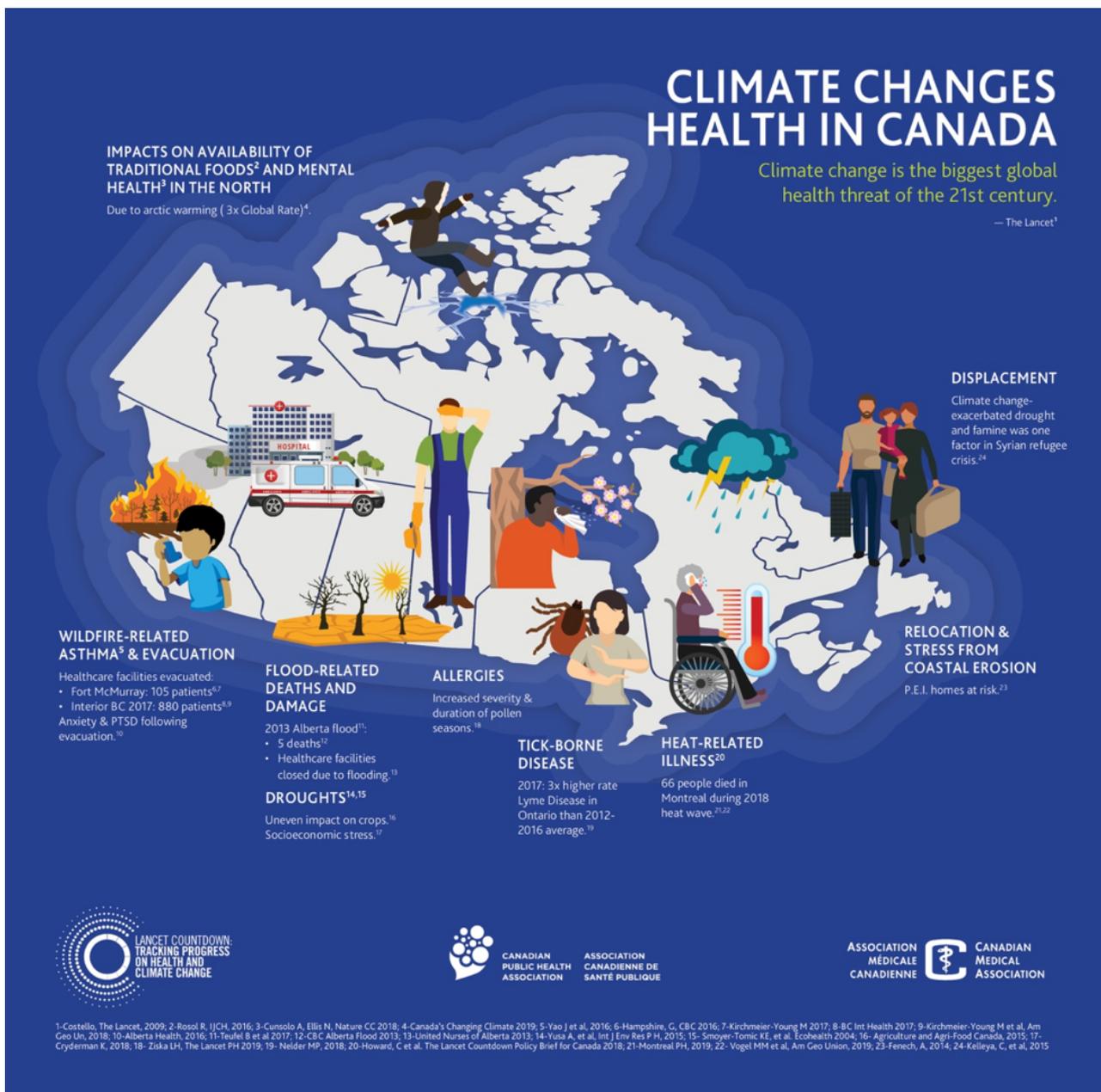


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Planetary health is defined by The Rockefeller Foundation-Lancet Commission on Planetary Health [3] as the achievement of the highest attainable standard of health, wellbeing, and equity worldwide through judicious attention to the human systems—political, economic, and social—that shape the future of humanity and the Earth’s natural systems that define the safe environmental limits within which humanity can flourish. Planetary health topics including climate change have not previously been covered in medical education, but they have a clear role in preparing students for their future practice and promoting understanding of public health and ecological determinants of health [4]. Internationally, there has been a push for medical schools to address the urgent need for planetary health-informed medical training. The International Federation of Medical Students’ Associations has called upon all medical schools to integrate teaching related to climate change into their curricula by 2020 [5], a point which has been echoed by many, including UK medical students who asked for “urgent action to safeguard the health of our future patients.” [6] The Planetary Health Alliance is actively engaged in supporting education on these topics globally [7].

Canadian medical schools must become leaders in this planetary health education movement. Fortunately, steps are already being taken to prepare future Canadian health care providers. Students and professionals alike can informally access resources such as a climate change toolkit developed by Canadian Association of Physicians for the Environment (CAPE), which provides concise modules for adapting to and mitigating the effects of climate change on patients and communities [8]. Further, anecdotally, many medical schools have already begun the process of incorporating planetary health topics into relevant parts of their curricula.

To achieve integration of planetary health education into already packed curricula, a national strategy is warranted. While administrators, faculty and student groups work toward curriculum change at individual schools, the development of accredited planetary health objectives would ensure a national standard of teaching and preparation is met. The CFMS Health and Environment Adaptive Response Task force (HEART) is a national group of medical students advocating for increased awareness of health-related impacts of climate and other environmental changes. Since 2016, HEART has worked with experts to create a set of Planetary Health Competencies - focused curricular objectives similar to the style of the Medical Council of Canada (MCC) objectives [9]. The goal is to provide educators with a learner- and faculty-reviewed framework for medical education on planetary health in Canada, with an ultimate aim of formalizing these through national accreditation.

To track progress toward achieving the IFMSA’s 2020 vision: that every medical school globally incorporate some aspect of planetary health teaching by 2020, HEART solicited feedback from students and faculty at all Canadian medical schools. The goal of this informal evaluation survey is to inform current success and national areas for improvement in planetary health education.

Methods

The informal cross-sectional national survey was developed from August 2018 to February 2019 by CFMS HEART. Feedback on content was provided by a group of international experts including Dr. Courtney Howard, Canadian Association of Physicians for the Environment Board President; Dr. Lynne Madden, Associate Dean, Learning and Teaching at the School of Medicine, Sydney, The University of Notre Dame Australia; and Dr. Nick Watts, Executive Director of the Lancet Countdown: Tracking Progress on Health and Climate Change. The goal of this evaluation was not to publish academic results but rather to inform medical school administrators and educators on current successes and areas for growth. As such, ethics approval was not sought and feedback is provided as a general overview across all schools. On request (heart.cfms@gmail.com), any student or faculty member may request detailed feedback including the completed evaluation for their school.

The goals were twofold: (1) establish a baseline to track progress in implementing planetary health education in Canadian medical schools, (2) provide schools with best practices, common challenges across institutions and solutions or opportunities for growth.

The survey consisted of two parts. In the first part, respondents identified which components of their school's curriculum were already addressing planetary health topics. In the second part, respondents elaborated on planetary health topics and learning formats they would be interested in covering further. One evaluation survey form per school was sent to members of HEART's national medical student network to be completed collaboratively with the assistance of as many medical students and faculty members as possible. Responses were received between March 2019 to September 2019. Survey responses were reviewed systematically and coded using a bottom-up thematic analysis approach. Themes that arose are presented with accompanying recommendations. Themes included:

1. Developing engaging planetary health curricula
2. How planetary health is taught currently and insight into ways to improve
3. Where planetary health fits within curricula and current topics covered
4. Identified barriers to implementation of planetary health curricula
5. Student leadership and faculty support in extracurricular planetary health education

Results

1. Developing engaging planetary health curricula

There is clear interest from students and faculty to work on incorporating the impacts of climate change and health into their curricula. Respondents identified the positive role of faculty champions and mentors in assisting students to push for curriculum development.

Respondents were curious to see how other medical schools integrate planetary health into training. Some respondents indicated that they had already reached out to medical education directors who were supportive of this initiative. At the University of Toronto, this led students to assist with the development of a one-page pdf distributed by the faculty with resources including links to key websites and videos to guide self-directed learning.

Many respondents suggested reaching out to students to discuss how this topic can be made relevant, practical and engaging. Respondents stressed the importance of developing specific longitudinal learning objectives to guide teaching and learning. A key aspect of engaging teaching was involvement of experts knowledgeable and active in the field. Respondents indicated that presenting specific examples of projects can help students engage with the topic in a meaningful way.

Recommendation 1: Acknowledge students are learners with a vested interest in their own education and work with them in meaningful ways to improve planetary health teaching.

Recommendation 2: With student and faculty input, work to develop specific longitudinal learning objectives for engaging planetary health education.

2. How planetary health is taught currently and insight into ways to improve

Some schools have developed dedicated lectures on planetary health and respondents recognized that internal mechanisms for curriculum development have already led to identifiable improvements. Some respondents indicated that whether or not dedicated lectures on this topic could be added, it was appropriate to incorporate material within existing lectures where relevant. For some respondents integrating planetary health competencies throughout the curriculum was their ideal, particularly when linked to clinical practice. Other respondents indicated that where this had already been implemented, the topic was often raised in passing or at the end of lectures making it hard to discuss deeply. Some respondents raised concerns that some lectures on climate change and health often focused on the roles of others, such as urban planners, rather than what physicians could contribute.

Case-based learning was identified by respondents to be more engaging than didactic lectures; however, it was acknowledged that the quality and depth of discussion and learning varied based on individual groups, particularly when student-driven. Some respondents suggested integrating small group problem-based tutor guided sessions after lectures could help cement knowledge for students and help them to think through how changes to climate can impact their practice. This has already been implemented at several schools with positive feedback from respondents: readings associated with problem and case-based learning were assigned to all students, and reflective questions guiding the discussion help students to engage with the topic.

A WHOMUN session on climate change and population displacement held for year 1 students at the University of Alberta was an innovative format to discuss health impacts of climate change. It included pre-assigned reading material and information resources, then the class was split into small groups to represent specific countries, followed by a whole-class debate plenary session. Students were encouraged to research around their case study, focusing on impacts of climate change and potential policies to mitigate the negative impacts. However this was a one-time theme for the model WHO assembly in 2018-19, and may not be repeated in future years.

Project-based learning was identified as one way to allow students to identify their own areas of interest within planetary health and develop a range of relevant critical skills. Many respondents indicated that they had research or community projects within their pre-clerkship education that could be used to focus on the health impacts of climate change and environment, though this topic was typically not specifically mentioned as a possible focus. For some respondents these projects were 'service learning' projects involving the development of partnerships with community organizations, which could include collaborating with organizations focused on the environment and action on climate change. For other respondents these projects were more research focused, and sometimes offered as extracurricular (not mandatory) projects. Development of a research project regarding the health impacts of climate change was dependent upon institutions having affiliated researchers who could be project supervisors. When institutions had faculty working in this area, respondents indicated that these research opportunities could be highly engaging, effective and rewarding. Respondents acknowledged that projects such as developing continuing medical education for practicing health professionals, were one way to challenge students to engage with the subject in a meaningful way.

One example of a project-based learning opportunity came from the Northern Ontario School of Medicine which has developed an assignment for first year students to research and write a short paper about the impacts of climate change on health in northern communities and ways that physicians can help address these impacts. Such a project could be adapted to other schools, helping students to identify how climate change is affecting communities in their local area.

Recommendation 3: Develop lecture-based, case-based, or project-based planetary health teaching that addresses the local health impacts of climate change and meets defined learning objectives.

Recommendation 4: Encourage students towards planetary health topics as a focus of community-based projects, research, or service learning opportunities.

3. Where planetary health fits within curricula and current topics covered

Schools had varied approaches to where planetary health topics fit within curriculum. Some respondents reported that it is covered within the public Health and preventative medicine sections; others discussed it within the broader social determinants of health framework. This framework, often already integrated into medical curricula, could be adapted to speak about ecological determinants of health and as a transition to teaching on planetary health. Teaching around Indigenous health topics may be another opportunity to address climate change and health due to the significant impacts already being felt by Northern and remote communities. Some respondents indicated that their school discussed planetary health impacts through the lens of occupational and environmental exposures.

Topics covered in many medical schools align well with HEART's Planetary Health Competencies. Despite considerable variation, respondents reported training in:

- respiratory health and air pollution;
- heat related illness;
- anxiety and depressive disorders, including suicide risk associated with change in land-use; temperature associated changes to West Nile distribution and Lyme disease-carrying tick habitat range;
- the role of flooding in increasing the incidence of infectious diseases; natural disaster relief; and capacity building.

Some schools focused on local Canadian examples such as: impacts of the climate crisis including flooding in southern Alberta, and forest fires in BC and around Fort McMurray, AB; or other environmental impacts on health (besides climate) including mercury pollution in Grassy Narrows, ON, and the E. coli outbreak in Walkerton, ON.

Key areas for discussion included the costs and mortality associated with climate change, and the social impacts of disruption, including displacement and mental health impacts. Many respondents indicated that the inequitable distribution of impact, exacerbating existing health vulnerabilities, was an important aspect of teaching. Respondents also identified that interventions against climate change had health co-benefits for other current health epidemics (for instance, sustainable nutrition and prevention of obesity and chronic diseases).

Student respondents indicated that they were particularly interested in learning practically about how climate change will affect their future practice. Many respondents indicated that existing teaching did not focus enough on what could be done tangibly by individuals or by physicians, though case-based learning helped provide real solutions and discussion around interventions. The concept of One Health (the relationship between humans, animals, and other living things) was discussed at several institutions, however some respondents felt that this topic was difficult to engage with as it was perceived to be too peripheral to clinical practice. Some respondents indicated that though their assignments focused on one impact of climate, this functioned as a springboard to learning more. While many of the topics came up within case-based learning, some respondents indicated that clarifying the link between the cases and climate change would improve discussions.

Specific skills that were identified as learning objectives included learning to classify risks related to environmental hazards, clinical environmental health history-taking, developing an approach to environmental risk assessment. Some respondents identified that their curriculum provided excellent teaching around management and investigation of environmental health exposures but provided little teaching on ways that healthcare professionals can help mitigate climate change. Some respondents suggested that including recommendations around environmentally sustainable routines and behaviours for patients would be one way to transcend simple exposure history taking within training.

Teaching around local physician advocacy efforts, such as advocacy around arsenic, is one way to help students understand their CanMEDS Advocate role. At the University of Calgary, for example, teaching by CAPE Alberta physician leaders includes specific examples of how physician advocacy on pollution, climate change, and other issues can lead to real policy changes.

Resources such as the Green Office Toolkit – For Clinicians and Office Managers (developed by the Canadian Coalition for Green Health Care)[10] and the Climate Change Toolkit for Health Professionals (developed by the Canadian Association of Physicians for the Environment)[8] can guide schools teaching around the role of physicians.

Recommendation 5: Using available resources, such as the CFMS HEART Planetary Health Competencies, develop curricula that provides medical students with an understanding of local and national health impacts of climate and other environmental changes and ways that health professionals can address these.

Recommendation 6: Ensure curriculum distinguishes the field of environmental and occupational health from that of planetary health.

4. Identified barriers to implementation of planetary health curricula

Despite the significant interest in integrating planetary health within curricula, it was acknowledged that time is precious in undergraduate medical education, particularly within 3-year programs. Respondents recognized the difficulty in modifying already packed medical school curriculum, as adding new lecture material often displaced existing teaching. All respondents discussed pre-clerkship training, however teaching on planetary health can continue within the clerkship period and may be more relevant as students are within the clinical environment. Respondents at one institution identified that the transition period between pre-clerkship and clerkship may be a specific opportunity to address topics such as sustainable healthcare practices. Some respondents perceived their curricula to be full and were more interested in adapting existing lectures than introducing new dedicated sessions. Challenges identified with this approach included the logistics of reaching out to diverse lecturers to request that they include relevant information, and the lack of time for in-depth discussion of issues when touched upon in sessions on other topics.

Recommendation 7: Acknowledging that time within medical curricula is precious and limited, incorporate planetary health teaching into existing or new sessions to provide students with an understanding of the multifaceted health impacts of climate and environmental changes and practical applications for physicians.

5. Student leadership and faculty support in extracurricular planetary health education

Respondents indicated that student groups had developed at most schools, to provide additional education opportunities and avenues for advocacy. Many of these groups provided extracurricular lunchtime talks with invited speakers and movie screenings. Some student groups address issues of sustainable healthcare including minimizing waste from healthcare facilities, while others engage in social media campaigns around dates such as Earth Week and Climate Action Day.

A student group at the University of Alberta runs a program for medical students to enter local elementary schools to provide teaching on environmental health topics including food scarcity, air pollution and climate change. Students at Dalhousie medical school assisted with a marsh clean-up in spring 2019 to help revitalize a natural area, organised a clothing swap to minimise fast fashion waste, and ran media/poster campaigns for Climate Action Day and World Water Day.

Respondents also drew attention to new roles within medical student societies and governance structures, such as 'Sustainability officers' and 'Local officer of climate change and health' who have varying responsibilities. For some, this role involved advocacy around environmentally friendly changes to university campuses, such as water fountain installation and projects to reduce single use dishes and cutlery. For others, this role involved raising awareness and educating medical students on health impacts of climate change, largely to supplement formal curricula. Some respondents indicated that their student governance structures had adopted position papers or environmental action statements to guide their actions in this area.

At the University of Toronto, the local officer of climate change and health has been conducting a targeted needs assessment to identify baseline knowledge and attitudes of students towards proposed curricular development in this area.

Student-led initiatives were acknowledged to vary in the depth of their engagement with planetary health and are largely optional. It was identified that environmental student groups were supporting extracurricular initiatives without access to sufficient funding, and some groups in fact had recently lost funding to support their activities.

Faculty can also support extracurricular education, such as at Laval where faculty have organised conferences on social responsibility which touch on health impacts of climate change. At Sherbrooke, faculty supported extracurricular education through platforms such as departmental presentations, rounds and conferences.

Respondents from Memorial indicated that students had access to a faculty-developed online course on Global Health that covers environmental health. The Canadian Association of Physicians for the Environment was identified as a possible avenue for students to engage with practicing physicians undertaking ongoing advocacy initiatives.

Respondents at several institutions indicated students were keen to learn more about developing sustainable health care practices, including addressing waste from surgeries and reducing the carbon footprint of health care settings. Some respondents indicated that physicians have a role to play in modelling sustainable behaviour for others.

The clerkship electives and CaRMS interview process, often involving multiple flights, was identified to have a high carbon footprint and be a significant financial burden. Medical students in Canada may have the highest per capita carbon footprint of any post-secondary university program. Specific medical specialties, such as urology, have worked to address the cost and impact by hosting interviews on one day in one central location. This was perceived by

respondents to be a worthwhile modification with psychological and financial co-benefits for students. Respondents conceded this may not be possible with larger specialties. An alternative model was proposed, whereby interviewers visit schools, or a few specific regional locations which could drastically reduce the number of flights involved. Transitioning to video-conference interviews was also identified as a possible way to reduce the high carbon footprint.

Recommendation 8: Support student initiatives to improve planetary health education and student advocacy efforts around the health impacts of climate change.

Recommendation 9: Acknowledge that physicians have a responsibility to model sustainable behaviour in their personal and professional lives, beginning as medical students.

Strengths and Limitations

There were many strengths to be recognized in this evaluation process; however, it is important to interpret the results with acknowledgment of the limitations of our evaluation, which we hope to improve upon with each year's evaluation.

Strengths

- First evaluation of its kind in Canada.
- Entirely bilingual evaluation, ensuring inclusion of all English-speaking and French-speaking schools.
- Inclusion of 17 out of 17 medical schools participating in the evaluation, with student input in 15/17 and faculty input in 9/17.
- Recognizes that teaching styles are particular to different schools and surveys numerous different types of teaching methods in an attempt to capture any planetary health education currently in the curriculum or extracurricularly.

Limitations

- The participation and sample size of teams of student and faculty leaders in completing evaluations varied (and, in two cases, was not reported), limiting accuracy and comparability of results
- Typically respondents were students with a particular interest in planetary health.
- The survey provides only a cross-sectional view of environmental curricula and does not include recent developments or changes to curricula (our hope is that these will be captured in future evaluations).
- The possibility of variations in teaching between different sites at multi-site schools was not accounted for.

Acknowledgments

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Early feedback on analysis was provided by Dr. Courtney Howard, Canadian Association of Physicians for the Environment (CAPE) Board President and Dr. Lynne Madden, Associate Dean, Learning and Teaching at the School of Medicine, Sydney, The University of Notre Dame Australia. This final report was reviewed by Dr. Courtney Howard and Dr. Joe Vipond, Canadian Association of Physicians for the Environment (CAPE) Board President-elect.

The evaluation survey used to collect the data presented was developed from Aug. 2018 to Feb. 2019 by the CFMS HEART Committee 2018-2019. Feedback and suggestions were incorporated from experts including Dr. Courtney Howard, Dr. Lynne Madden, and Dr. Nick Watts, Executive Director of the Lancet Countdown: Tracking Progress on Health and Climate Change.

Graphic design and layout by HEART 2018-19 members Kevin Liang, Arianne Cohen and HEART 2019-2020 members Meghan Kerr, Celia Walker.

We would like to thank all of the medical student members of the HEART Network as well as faculty members at each school who worked hard through March-September 2019 to complete the evaluations. Students were encouraged to reach out to faculty at their schools to provide input to ensure the responses were as accurate and comprehensive as possible. We also had assistance from FMEQ (Fédération médicale étudiante du Québec), IFMSA-Québec including 2019-20 President Yousra-Imane Benaskeur, and Charles-Antoine Barbeau-Meunier (Université de Sherbrooke, QC) who helped translate the evaluation to French and compile evaluations from FMEQ member schools.

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Resources

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