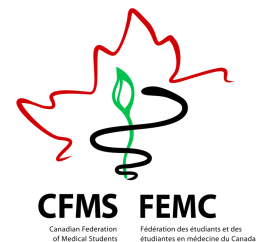


CFMS HEART: NATIONAL REPORT ON PLANETARY HEALTH EDUCATION 2021

AUGUST 2021





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NATIONAL REPORT ON PLANETARY HEALTH EDUCATION 2021

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EXECUTIVE SUMMARY

Climate change poses a severe and growing burden on human health. These effects manifest themselves through several direct (i.e., morbidity or mortality from extreme weather-related events) or indirect pathways (i.e., air pollution-related respiratory diseases, water and food-borne diseases, malnutrition, vector-borne and infectious diseases, and mental health conditions). The healthcare system plays a major role in responding to and mitigating the effects of climate change. Not only does climate change weaken the health system's ability to respond to mounting threats, the health sector alone is responsible for ~5% of global GHG emissions, contributing significantly to pollution and climate change. Thus, education on the connections between climate change and health is crucial in order to prepare medical students to provide care with a smaller ecological footprint, and treat patients with health conditions caused or exacerbated by climate change. Despite this, planetary health education continues to be underrepresented in Canadian medical curricula.

The Health and Environment Adaptive Response Task Force (HEART) is a working group of the Canadian Federation of Medical Students (CFMS) that coordinates efforts in planetary health and climate change advocacy among Canadian medical students. Recognizing the threat of climate change and the need for education accordingly, in 2019, HEART published its first report on the status of planetary health education within the curricula of Canadian medical schools. The report evaluated each medical school across Canada through a cross-sectional national survey on the degree to which it incorporates planetary health education in the curriculum. This included qualitative indicators, such as topics in planetary health, teaching modality, learning objectives, and quantitative indicators, including hours of teaching. The report concluded that there was inadequate teaching on planetary health in medical schools across Canada. Following its publication, HEART published 9 recommendations for universities to strengthen their undergraduate medical education curriculum in the hope of better preparing Canada's future physicians to work in a climate crisis.

To monitor the progress made by medical schools across Canada in response to the 2019 report recommendations, a re-evaluation was conducted. This year's iteration of the survey was also cross-sectional by design. Students and faculty from each of Canada's 17 medical schools gave feedback on specific domains of planetary health education and the changes that were made to curriculum since the previous evaluation. The 2021 National Report on Planetary Health Education is a reflection of the advocacy and leadership exhibited locally, nationally, and internationally by medical students and faculty in scaling up planetary health education.

This year's survey demonstrates progress since the publication of its previous iteration. While planetary health is not yet adequately represented in Canadian medical education, it must be acknowledged that the changes that have been made in the midst of a global pandemic are a testament to the dedication of key student advocates and faculty stakeholders in identifying the deficits and implementing steps in achieving progress.

Despite these successes, the report reveals several shortcomings in the state of the curriculum that require urgent attention. More specifically, medical students across Canada identified two areas necessitating focused teaching in undergraduate medical curriculum. First, the connections between planetary health and other social determinants of health, and second, environmental sustainability in clinical practice. Additionally, the report demonstrated that most changes that have occurred have been student-driven. Though students are pivotal in advocating for planetary health education, faculty leadership and commitment are critical in the integration of long-lasting planetary health material in medical curricula. In order to prepare future physicians to best serve current and future patient populations, it is imperative that planetary health concepts are universally and comprehensively embedded into Canadian medical education. Based on this report, we have developed 8 new objectives to further guide and encourage faculty and student leaders across Canada to adequately integrate planetary health education into medical school curricula.

"BASED ON THIS REPORT, WE HAVE DEVELOPED 8 NEW OBJECTIVES TO FURTHER GUIDE AND ENCOURAGE FACULTY AND STUDENT LEADERS IN PLANETARY HEALTH ACROSS CANADA TO ADEQUATELY INTEGRATE PLANETARY HEALTH EDUCATION INTO MEDICAL SCHOOL CURRICULA."

SUMMARY OF RECOMMENDATIONS:

1. **Problem based learning & simulations:** Incentivize medical student engagement in planetary health topics by extending learning opportunities beyond didactic lectures and into small-group problem based learning through clinical cases, and/or simulation activities.
2. **Indigenous justice, traditional knowledge & environmental racism:** Educate students about planetary health through a reconciliation, self-determination, and climate justice lens. This should be presented in the context of the ongoing impacts colonization and resource exploitation has on the health and well-being of Indigenous communities. In addition, medical students should be aware that Indigenous knowledge systems, which emphasize the importance of interconnection, interdependence, and stewardship of all of our natural systems, are essential to re-envision our health sector to be more sustainable.
3. **Intersectional integration:** Avoid addressing the topic of planetary health in an isolated fashion. Planetary health curriculum must make the connection between climate impacts and the social determinants of health (including racism, poverty, refugeeism, and gender inequities) in addition to teaching about the downstream impacts of climate change on our physical and mental health.
4. **Strategic planning:** Develop specific planetary health competencies that are documented within longitudinal strategic plans to maintain accountability and demonstrate high-level leadership and support.
5. **Collaboration:** Collaborate with and learn from organizations and universities working on planetary health initiatives. The diverse range of projects and curricular developments across Canada highlight the opportunity for schools to learn from each other and build off already formalized education material.
6. **Faculty and community leadership:** Identify faculty or community leaders with expertise in healthcare sustainability and/or resource stewardship quality improvement in each medical school to meet medical student demand for sustainable healthcare learning opportunities.
7. **Develop learning objectives:** With student and faculty input, and using available resources such as the CFMS HEART Planetary Health Competencies, medical schools must develop specific learning objectives throughout the duration of medical education to ensure medical students are adequately prepared to practice in a climate crisis.
8. **Need for faculty leadership:** Ensure there is high-level leadership and support for planetary health curriculum integration. Medical students are leading the development of curricular and extracurricular planetary health educational opportunities. Enhanced commitment from faculty and collaboration between faculty and students is required to meet the upswell of medical student interest in planetary health topics.

WELCOME

Dear colleagues,

Thank you for your continued interest in planetary health education within Canadian medical undergraduate programs. Whether you are a HEART network member, planetary health physician, planetary health student leader, or a medical school dean who took the time to discuss the 2019 report, thank you for continuing to advocate for planetary health and climate justice, the safe and fair allocation of resources, and the protection of the environment in which we live, work, and breathe.

This year, medical schools across Canada adopted an online teaching platform along with several changes to their curricula in order to keep students safe amidst a global pandemic. Despite these unforeseen changes to the medical education landscape, we have seen an adoption of planetary health education across many universities. Several medical schools have either integrated lectures dedicated to the health effects of climate change, or have integrated teaching on climate change within existing medical lectures. This past year was also a testament to the creativity that can inspire our education. In line with the virtual platform, medical schools invited renowned national experts to teach topics surrounding social issues without airplane emissions, and utilized tools that allowed for safe and accessible discussions. We also saw an increase in the usage of online modalities for the dissemination of information, including modules, articles, and videos. With the use of online platforms, we have observed an increase in knowledge dissemination, whereby schools have invited students from other schools across the country to attend lectures surrounding climate change and health. These events highlight the progress that was achieved despite the immediate modification of curriculum delivery that our faculty saw this past year.

Since the publication of the 2019 National Report on Planetary Health Education, Canadian medical schools have achieved positive strides in planetary health education but still have much more work to do. Please read our full-length report that celebrates the accomplishments of each of our schools and identifies pertinent avenues for improvement. In accordance with our goals as a community, we hope this report will serve as a baseline for the acceleration of planetary health principles into undergraduate medical curricula in Canada.

Regards,

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INTRODUCTION

CFMS HEART Committee

The Health and Environment Adaptive Response Task Force (HEART) is a national collective of medical students across Canada that was established by the Canadian Federation of Medical Students in 2016. HEART's goal is to coordinate medical student-led advocacy efforts nationally regarding current issues in environmental health and climate change. One of HEART's core targets is the development and integration of an evidence-based set of planetary health competencies into the curriculum of every Canadian undergraduate medical education program. Since its inception, HEART members have advocated locally at medical schools for the adoption of these competencies, and nationally to both the Committee on Accreditation of Canadian Medical Schools (CACMS) and the Medical Council of Canada (MCC). HEART requested that the CACMS develop medical school accreditation standards addressing teaching around planetary health. Furthermore, HEART has assisted the MCC in drafting natural disaster preparedness learning objectives, and has proposed planetary health learning objectives for the MCC Qualifying Examination. Since its initial days, HEART has made strides in planetary health education which is apparent in that almost all Canadian medical schools have embedded some planetary health education into their respective curricula since HEART's advocacy efforts began.

Climate Change & Planetary Health

The evidence demonstrating the effects of climate change on human health is well-documented and growing. According to the World Health Organization, by the year 2030, there will be an estimated 250,000 additional deaths per year attributable to climate change (1). Climate change contributes to downstream health effects, such as air-pollution related respiratory diseases, water and food-borne diseases, malnutrition, vector-borne and infectious diseases, and mental health conditions (2). The greatest drivers of climate change are anthropogenic, with the largest being the burning of fossil fuels (3). In addition to the direct health effects from extreme weather events, the climate crisis has begun to disrupt social, cultural, and geographic frameworks, disproportionately impacting society's most vulnerable. Changes to environmental conditions, such as frequent and prolonged droughts, are drivers of population displacement, adding to the growing population of climate migrants (4). In addition to the suboptimal health outcomes individuals experience as a result of their low socioeconomic status, climate migrants are subject to the health effects of displacement camps, including infectious diseases, malnutrition, sexually transmitted infections, and mental health conditions (5).

Climate change is observed to have a larger effect on those most marginalized in society, including those experiencing homelessness, the elderly, people with disabilities, individuals living in regions of low socioeconomic status, and racialized communities including Indigenous peoples, Black people and people of colour, and minority populations (6,7).

The concept of planetary health includes, but is not limited to, the impacts of climate change on health. Planetary health recognizes that human health and the welfare of the planet are intricately intertwined (8). While human health has made incredible strides and continues to progress, the depletion of our natural systems threatens our ability to maintain these improvements. The Rockefeller Foundation-Lancet Commission on Planetary Health has defined planetary health to be “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” (8). Our physical and mental health is a reflection of the level of protection and care we collectively give to the natural systems upon which we depend.

The Role of Healthcare Professionals

Healthcare professionals are reported to be the most trusted professionals in the public eye, and are thus well-positioned to initiate and lead discussions on the health effects of climate change (9). The 2020 Report of the Lancet Countdown states that “doctors, nurses, and the broader profession have a central role in health system adaptation and mitigation, in understanding and maximizing the health benefits of any intervention, and in communicating the need for an accelerated response.” (10). The report also states that there has been considerable progress observed in terms of the engagement of the healthcare system and health professionals with climate change globally (10). Similar to the education received on the health risks of smoking, obesity and sedentary lifestyles, future physicians should be educated on climate change in order to provide counselling and preventative care to their patients (9). Educating medical students on climate change and its disproportionate effects on marginalized communities provides them with the opportunity to critically understand the determinants of health that are socially and environmentally rooted (11).

“The health professions need to respond with urgency for three reasons. First, health care contributes 4.4% of global greenhouse gas (GHG) emissions worldwide (Health Care Without Harm 2019). Second, health care workers will be at the forefront of dealing with the social and health impacts of increasing global GHGs which include respiratory and cardiac problems due to air pollution, as well as poverty, starvation, the resurgence of previously managed infectious diseases, mass dispossession of populations, and increasing cancers due to carcinogenic pollutants. The third reason is that health systems will be disrupted by extreme events, challenging their capacity to deliver services at critical times.” (12)

Training Medical Students

Medical students in Canada need to be taught about planetary health, including climate change (12-14). As future health professionals, they will be caring for patients, families and communities whose health is impacted by the changing climate and environmental conditions. The effects of climate change on the health of Canadians are becoming increasingly clear, from a documented rise in Lyme disease cases in Ontario to wildfire-related hospital evacuations in British Columbia (13,15,16). Additionally, the relationship between climate change and health is not unidirectional; healthcare emissions continue to worsen climate change on a national and global level (17,18). In order to provide optimal care, it is imperative that students understand the root cause of their patients' presentations and practice and advocate for environmentally-conscious healthcare (11,19). This is critical to foster a generation of physicians who are equipped to diagnose and manage conditions that are becoming more frequent as a result of the changing climate and ongoing environmental degradation, and to advocate for policies to prevent further health impacts on communities.

Planetary Health Curriculum

The integration of planetary health topics into the medical curriculum prepares students for their future practice as physicians. In recent years, there has been an international effort to encourage medical schools to address the urgent need for planetary health-informed medical training. For example, the International Federation of Medical Students' Associations (IFMSA), which currently represents 1.3 million students worldwide, recognizes planetary health curriculum as a priority and is advocating for its integration into the core curriculum of all medical schools (14).

As documented in the 2019 HEART National Report on Planetary Health Education, medical schools across Canada are taking steps to build planetary health education into the curriculum and are supporting student extracurricular initiatives. Additionally, both students and medical professionals have access to a variety of resources, such as the climate change toolkit developed by the 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 (20).

Our aims

Long-term and sustainable changes to medical education require accountability and transparency. In order to ensure that Canadian universities are appropriately integrating planetary health into their curriculum, it is important that a baseline from each school is obtained and reassessed at regular intervals. In 2019, the CFMS HEART Committee generated a cross-sectional national survey, which was implemented to inform the inaugural CFMS HEART: National Report on Planetary Health Education 2019, published in January 2020 (21). The 2021 National Report on Planetary Health Education aims to determine the current state of planetary health education at Canadian universities, assess what changes have been made since the initial survey release, and make available examples of initiatives to inspire schools across Canada to learn from each other and avoid reinventing the wheel. Through both quantitative and qualitative follow-up on key indicators, we hope to inspire the universal integration of permanent and robust planetary health education nationwide.

METHODS

For the 2021 curriculum re-evaluation, we used a cross-sectional national survey methodology as used in the 2019 National Report on Planetary Health Education. The survey is a largely subjective analysis which gives students and faculty the opportunity to comment on many aspects in the curriculum. This was sent to student and faculty informants at all 17 medical schools in Canada. Surveys were collected between January to March 2021.

The first component of the survey is a scale in which respondents attribute a score from 1 (Needs Improvement) to 4 (Excellent) on their curriculum's performance across specific domains (maximum possible score out of 29). These domains include: modality of content incorporation (i.e. lecture, problem-based learning, modules, etc.), types of learning objectives covered, lecture material (if applicable), problem based learning (if applicable), presence or absence of assessment opportunity, and availability of extracurricular student opportunities.

The second portion of the survey consists of a short-answer questionnaire, which allows respondents to indicate the topics covered, courses offered and how their university has incorporated the 9 recommendations from the 2019 National Report on Planetary Health Education (see appendix). In addition to the questions from the 2019 National Report, quantitative questions were added to determine the number of hours of curriculum that were added or removed in the past year.

At each of Canada's 17 medical schools, a student was appointed as curriculum liaison, or point of contact, by the HEART Committee. The curriculum liaison was responsible for survey dissemination, student focus group coordination, and timely return of survey results to the HEART committee. Each curriculum liaison was given two identical copies of the survey, intended to be completed by two groups separately; 1. the student focus group; and 2. the designated faculty member(s). Focus groups were asked to include 5-10 students across all years spanning the pre-clerkship and clerkship components of medical school. The survey was made available in English and French.

Survey results were analyzed by members of the HEART Committee Curriculum evaluation team by qualitatively analyzing responses to summarize key findings at each medical school. New initiatives were also identified in responses. The questionnaire asked respondents to comprehensively list their initiatives. As such, initiatives not identified within survey responses were not included in this report to reduce bias.

SURVEY RESULTS

Table 1: This table presents feedback from student focus groups at each Canadian medical school. Surveys completed by faculty were also used to identify any curricular components not included in the student surveys. This table highlights strengths of each program and areas for improvement.

School	Total Number of Participants	Student/Faculty Identified Strengths	Student/Faculty Identified Areas for Improvement	Hours Added in Last Year
UBC	10	1. 2-hour dedicated lecture on Climate Change and Health for all students (Yr 1 - 4) by Dr. Courtney Howard, Dr. Melissa Lem, Dr. Mary Kestler. 2. 2-hour mandatory lecture for students entering clerkship (Yr 2) on Planetary Health and Green Healthcare. 3. Active Student Group (EnviroMed) with numerous ongoing initiatives. 4. Integration of climate change and health objectives in respiratory week.	1. More consistent integration of climate change and health learning objectives across all weeks. 2. An introduction to Climate Change and Health/Planetary Health lecture at the beginning of first year.	1.5 hours
UofA	6	1. 3-hour lecture on climate change for ~40 Y1 students in an optional community engagement program. 2. Sustainability Officer student role.	1. More integration of climate change and planetary health topics across the curriculum.	0 hours
UofC	10	1. Allotted time to watch two videos on climate change and health followed by a mandatory small group session on climate health. 2. Longitudinal integration: One slide on the impacts of wildfires on asthma exacerbations was added to a lecture on pediatric respiratory health. 3. Family Medicine clerkship academic half day on Planetary Health ~1.5 hrs 4. Ongoing efforts: The Calgary Climate Wise Project Green Healthcare/Projet Vert la Santé Team is working to integrate more planetary health topics into the Calgary Medical Curriculum throughout all pre-existing pre-clerkship courses. A 1-hour introductory lecture to this project and Planetary Health has been added to the class of 2024s orientation week	1. Planetary health topics integrated into skill-based learning. 2. Greater emphasis on greening the healthcare system and talk on resource stewardship in medicine. 3. Integration of competencies within UofC's strategic plan	2.5 hours




School	Total Number of Participants	Student/Faculty Identified Strengths	Student/Faculty Identified Areas for Improvement	Hours Added in Last Year
USask	9	1. 2 dedicated sessions on climate change and health (1 in Yr1 and 1 in Yr2).	1. Improved engagement in Climate Change and Health lectures. 2. More focus on actionable outcomes and vision for what the future can look like. 3. Increased experiential learning related to planetary health and environmental racism.	2 hours
UofM	7	1. Student-led environmental group that holds sessions on sustainability in medicine and other environmental topics. 2. Surface level discussions of climate change and health in select global and population health lecture sessions.	1. More information about the impact of the medical system on the environment and how to make sustainable decisions in a healthcare environment. 2. More information about the impacts of climate change incorporated into every module. 3. Would like to create a Local Officer of Planetary Health position.	0 hours
NOSM	7	1. Case based learning where students discuss articles in Yr1. 2. New guest speaker on climate change and Indigenous health. 3. 2021-2025 Strategic Plan with focus on environmental health and climate change.	1. Broad focus throughout the curriculum between climate change and human health both locally and globally. 2. Education on how to incorporate ideas of climate change and sustainability in practice as physicians.	1.5 hours
Western	7	1. 2 three hour climate health small group sessions have been added to the curriculum recently. 2. Students are able to pursue research projects and QI projects around climate change and health.	1. Greater integration of climate change and health content integrated into normal lectures in addition to sessions explicitly on climate change and health.	6 hours (2 sessions)
McMaster	6	1. 1 hour introductory lecture (optional) that provides high-level information intended to inspire student involvement in climate change related efforts. 2. A number of professors with a special interest in the topic lead initiatives around the Hamilton community. 3. There are interest groups and student-run initiatives who hold events and conferences on the topic (e.g. speaker events/series).	1. More introductory sessions regarding climate change and health in order to get more people interested and involved. 2. Education regarding climate impacts linked to social determinants of health (e.g. poverty, refugeeism, Indigenous health, economy, gender equity, racism). 3. More practical sessions to develop skills/have resources to combat problems.	1.5 hours
UofT	8	1. A number of sessions in both 1st and 2nd year, including an introduction to climate change, why physicians should care about climate change, climate justice, and environmental racism. 2. Meaningful involvement of students in the curriculum development process. The process of incorporating planetary health learning objectives has been student-led with support from faculty.	1. More learning objectives/testable content (and/or discussion questions) to ensure participation. 2. Slides at the end of lectures with statements on how the learning content (e.g. respirology) relates to planetary health. 3. Waste management education in clerkship. 4. Planetary health representative to act as a point person for planetary health concerns and questions.	4 hours






































School	Total Number of Participants	Student-Identified Strengths	Student-Identified Areas for Improvement	Hours Added in Last Year
Queen's	5	<ol style="list-style-type: none"> Several recent changes have been made, including an online module on planetary health, 1 multiple choice question added to the exam, and climate change as a determinant of health added to a small group learning session. Several areas of student involvement including the Environmental Advocacy in Medicine Interest Group. 	<ol style="list-style-type: none"> Climate change-related lectures as opposed to just discussion of environmental impacts. More case-based learning, and more focus on advocacy and practical suggestions for being greener physicians. 	1 hour
UofO	4	<ol style="list-style-type: none"> There are faculty members that are very supportive of student initiatives in planetary health. 	<ol style="list-style-type: none"> More content on the relationship between climate change and health. Teaching on actions that students can take, including in the clinical setting. 	0 hours
McGill	11	<ol style="list-style-type: none"> Two lectures pertaining to Climate Change and Health (year 1 and year 2). Interprofessional Global Health Course (IPGHC) that students can register for with some climate change related sessions. McGill offers a selective (INDS 426) which consists of 8 climate change related topics. 	<ol style="list-style-type: none"> Offer a Planetary Health elective opportunity Integrate planetary health and greening practices into the two week Public Health period at the end of Med-4. 	0 hours
UdeM	6	<ol style="list-style-type: none"> Some courses with light integration of climate change. Non-obligatory course exploring several aspects of climate change and health (added 2020). 	<ol style="list-style-type: none"> More mandatory teachings. More objectives built into teachings with a few related questions on the exam. 	1 hour
Laval	8	<ol style="list-style-type: none"> Assessment in the form of a team discussion and analysis of texts on the subject of climate change. Effects of climate change on vulnerable populations covered in lecture. Integration of various topics in climate change represented in lectures. 	<ol style="list-style-type: none"> Workshops and discussions following compulsory readings on the subject in order to better integrate the concepts of the readings. More education regarding the ecological footprint that the health sector generates. Clinical cases in our lectures that illustrate the impact of climate change on health. Integration of climate change curriculum into all courses. 	0 hours
Sherbrooke	3	<ol style="list-style-type: none"> Integration of various topics in climate change represented in lecture. 	<ol style="list-style-type: none"> A more broad integration of climate change across all courses. Incorporate public health course on the subject of climate change to facilitate student discussions. 	0 hours
Memorial	5	<ol style="list-style-type: none"> 4 hours of sessions related to Environmental Health & Emergency Response Preparedness (all in 2nd year). An existing environmental health interest group (currently not very active). 	<ol style="list-style-type: none"> More education regarding addressing climate change from a physician/ medical student's perspective and how we can incorporate this into our future practice. An introductory climate change lecture as a starting point to get more people interested and involved. 	0 hours
































School	Total Number of Participants	Student-Identified Strengths	Student-Identified Areas for Improvement	Hours Added in Last Year
Dalhousie	8	1.Planning to integrate all 12 of the HEART core competencies in the curriculum starting in 2022. 2.Working to better promote research opportunities. 3.The Dal Med Green Team advocates for curriculum changes and for sustainable health systems. 4.In the Fall of 2020 students had the opportunity to sign up for a student-driven interprofessional mini-course on health and climate change.	1.A designated working group has specifically been tasked with improving the inclusion of planetary health throughout all years of the medical school curriculum.	0 hours

Table 2: This table provides a high-level summary of planetary health curriculum components in Canadian undergraduate medical education (e.g., integration into lectures, problem based learning, and extracurricular opportunities for student involvement in planetary health initiatives). The information in this table is based on feedback collected from the student perspective, with integration of faculty insight where available. Universities with a score greater than 20 (maximum score 29) are identified as leaders in planetary health.

Legend:

-  = identified as present
-  = identified as excellent
-  = identified as a leader in planetary health medical education

Planetary Health Curriculum Components								
Leader	School	Learning Objectives	Longitudinal Integration	Lecture Based Content	Problem Based Learning	Assessment	Extracurricular Opportunities	Student Reported Total Score (/29)
	UBC							24
	U of A							13
	U of C							21
	USask							16
	UManitoba							13
	NOSM							18
	Western							20
	McMaster							12
	Toronto							23

	Queen's							19
	Ottawa							20
	McGill							17
	Dalhousie							17
	Memorial							16
	Sherbrooke							17
	Laval							19
	Université de Montréal							11

DISCUSSION AND RECOMMENDATIONS

Since the previous iteration of the survey, as seen in the 2019 National Report on Planetary Health Education, we observe an increased emphasis on planetary health and its importance in undergraduate medical education curricula. This shift must continue to ensure future generations of physicians are prepared to practice in a fashion that adapts to and mitigates the growing health impacts of climate change. The following discussion highlights the results of the survey as it applies to five overarching themes identified in the analysis. This includes (1) the past and current state of planetary health education in medical programs across Canada, (2) the recent changes in curricula that have been adopted in the past year, (3) an approach to planetary health integration, (4) areas of improvement, and (5) medical student leadership in extracurricular planetary health education.

1. Current state of planetary health teaching in medical schools across Canada

Medical schools across Canada are integrating planetary health teachings into curriculum through a variety of different modalities including didactic lectures, problem-based learning, and extra-curricular research. Although student-led initiatives are not formally part of curriculum, they also contribute to planetary health teachings in medical schools across Canada. This suggests that leveraging existing student-led interest groups is an effective way of further strengthening curricula with supplemental learning and leadership opportunities in planetary health.

The majority of teachings on planetary health and climate change across Canada are delivered in didactic lectures. While some Canadian medical schools have dedicated mandatory lectures for climate change, others entertain optional sessions that are largely a product of student organization (i.e., seminars, workshops, discussions, and guest lectures). Medical programs in Canada are between 3 and 4 academic years in length and are divided into a 1.5-2 year pre-clerkship, with learning primarily delivered in the classroom and laboratory, followed by a 1.5-2 year clerkship, with learning primarily delivered through rotations across medical services and specialties. Most mandatory and planetary health-dedicated lectures are for pre-clerkship students in years 1 and 2. Only 3 of 17 Canadian medical schools offer longitudinal learning frameworks for planetary health spanning from the pre-clerkship to clerkship years.

Based on survey respondents, there appears to be limited integration of planetary health and climate change teachings into existing medical lectures. This is an area where many survey respondents have raised the need for improvement across curricula. Results from the student surveys indicate interest in integration of planetary health education in teaching that is dedicated to respiratory medicine, (i.e. effects of air pollution on asthma/COPD), integration in psychiatry blocks (i.e. effect of climate change on mental health), and integration into the infectious disease block (i.e. effect of climate change on infectious disease burden and emergence nationally and internationally).

Some students voiced that although teachings on climate change are integrated into the curriculum, they are seldom explored in depth. For example, in instances where planetary health education is integrated into existing lectures on medical topics, students observe that planetary health topics are briefly mentioned without opportunity for further discussion. Some students also raised concerns that due to the COVID-19 pandemic, some lectures on climate change and health were pre-recorded, which were less engaging than previous live lectures that permit bi-directional question and answer periods.

Other delivery methods for teachings on planetary health and climate change include problem-based learning and extra-curricular research. Some survey respondents requested more small group, problem-based learning as it is more engaging and effective than didactic lectures. Feedback from students with problem-based learning sessions states the efficacy of teaching is largely dependent on the facilitator of each group, their knowledge on climate change and environmental health, and their enthusiasm in teaching. With the transition to virtual learning in medical schools in 2020, there exists an opportunity to make didactic lectures more effective by inviting experts from around the country. Problem-based learning sessions could also be augmented by including guest speakers or individuals with lived experience as facilitators. Students from all medical schools reported extra-curricular or research opportunities in topics related to climate change and planetary health.

Across universities, the material from most lectures on planetary health and climate change is largely not tested. Only 8 of 17 Canadian medical schools assess medical students on planetary health competencies.

Recommendation #1: Incentivize medical student interest in planetary health topics by extending learning opportunities beyond didactic lectures and into small-group problem based learning through clinical cases, and/or simulation activities.

SPOTLIGHT

University of British Columbia

Since 2019, the UBC Faculty of Medicine has been working in conjunction with student leaders in planetary health to incorporate a formal lecture on how climate change affects health into its curriculum. Students led its planning and organization, selecting the date and time and speakers and lecturers, creating the learning objectives, and facilitating the panel discussion.

The Truth and Reconciliation Commission (TRC) in 2014 included a specific call to action for Canadian medical schools. TRC article 24; “We call upon medical and nursing schools in Canada to require all students to take a course dealing with Aboriginal health issues, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, Treaties and Aboriginal rights, and Indigenous teachings and practices. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.” (22). Planetary health is tightly intertwined with the health and wellness of Indigenous peoples and communities. In addition, Indigenous ways of knowledge and knowledge systems, which emphasize the interdependence and mutual stewardship of all living and nonliving entities in our natural systems, add immense value to building sustainable healthcare systems (23). Only two medical schools specifically reported teachings related to the impacts of climate change on Indigenous peoples. However, this was not specifically asked in our survey and may be underreported. These teachings are delivered as didactic lectures, independent topics or integrated into existing lectures on planetary health. A number of surveys fail to show any integration of teachings regarding the impacts of climate change on the health of Indigenous peoples into the curriculum. This is an area where multiple survey respondents have expressed they would like to see more education.

Recommendation #2: Educate students about planetary health through a reconciliation, self-determination, and climate justice lens. This should be presented in the context of the ongoing impacts colonization and resource exploitation has on the health and well-being of Indigenous communities. In addition, medical students should be aware that Indigenous knowledge systems, which emphasize the importance of interconnection, interdependence, and stewardship of all of our natural systems, are essential to re-envision our health sector to be more sustainable.

Recommendation #3: Avoid addressing the topic of planetary health in an isolated fashion. Planetary health curriculum must make the connection between climate impacts and the social determinants of health (including racism, poverty, refugeeism, and gender inequities) in addition to teaching about the downstream impacts of climate change on our physical and mental health.

SPOTLIGHT

Northern Ontario School of Medicine

The Northern Ontario School of Medicine (NOSM) has established a guest lecture for students on climate change research in an Indigenous health context. The talk is provided to first-year students during their travel to Indigenous communities for culture-based learning.

2. Changes to Canadian undergraduate medical education curricula since last survey

As this is the second iteration of the CFMS HEART National Report, survey responses provided an opportunity to show changes to curriculum within the past year. The results of the 2019 curriculum evaluation and 2021 curriculum evaluation both indicated overwhelming support from students and faculty for incorporating more teachings on planetary health and climate change into curricula. Since 2019, 5 out of 7 Canadian medical schools have added more teachings to their curriculum. Survey respondents from the University of Calgary, NOSM, UBC, Queen's and Université de Montréal indicated their universities have included more teachings on climate change and planetary health in the past year. It is possible that changes in curricula have not been reflected by survey respondents representing their universities.

Planetary health teachings new to medical schools this year:

- University of Calgary: 1 hour lecture on planetary health in orientation week, 1.5 hour academic half day family medicine clerkship session on planetary health, 1 slide on wildfire smokes impact on pediatric asthma
- Northern Ontario School of Medicine (NOSM): A 1.5 hour guest speaker didactic lecture on Climate Change and Indigenous Health context.
- University of British Columbia: 2-hour dedicated lecture on Climate Change and Health open to all students. An additional 2-hour dedicated lecture and interactive assignment on green healthcare stewardship for students entering clerkship facilitated by both faculty and student leaders. The creation of optional online modules on the effects of climate change on health for all students.
- Queen's University: An online learning module on planetary health. Assessment with ~1 multiple choice question added to the exam. Environmental determinants of health, including climate change, were added into a small group learning session that broadly addressed determinants of health.
- Université de Montréal: A non-mandatory course exploring several aspects of climate change and health.

Some schools have highlighted a focus on developing curriculum with greater integration of climate change and planetary health. Dalhousie is currently undergoing curriculum redevelopment in the context of a transition to competency-based medical education. As part of this process, a designated working group has been tasked with including planetary health education throughout all years of the medical school curriculum.

The committee has proposed that all 12 of the HEART core competencies should be integrated into the curriculum over the next year. The Northern Ontario School of Medicine's 2021-2025 Strategic Plan also indicates a focus on environment health and climate change. The strategic plan positions a goal to "become a leader in internal practices that address 'climate change' and environmental health."

Recommendation #4: Develop specific planetary health competencies that are documented within longitudinal strategic plans, to maintain accountability and demonstrate high-level leadership and support.

3. Approach to including planetary health topics into undergraduate medical education curriculum

No uniform approach has been used to create a planetary health curriculum for medical students. A few approaches indicated in responses include integrating climate change education into existing curricula, dedicated lectures on climate change, creating community project opportunities and supplementing curriculum with extracurricular opportunities.

SPOTLIGHT

University of Calgary

The University of Calgary is piloting a new project, called Climate Wise, which is a student led project that aims to integrate planetary health teaching, informed by the HEART Core Competencies, across lectures and case-based small groups. The Climate Wise project is partially financially supported through the CFMS HEART's Project Green Healthcare/Projet Vert La Santé program. Thus far, the initiative has integrated 1 slide on asthma exacerbations during wildfires, which was taught in an upper respiratory infection lecture. The Climate Wise team will be integrating climate change and health teaching into all courses in the pre-clerkship curriculum starting with the class of 2024. Climate Wise was also granted a 1 hr time slot to introduce Climate Wise and general planetary health principles to the class of 2024 during orientation week. After incorporating feedback from students and faculty, The University of Calgary Climate Wise project aims to have a completed slide deck that may be implemented at every medical school across Canada by 2022.

It is apparent from survey respondents that curriculum at different universities varies in the opportunities available for their students within the curriculum. For example, at the University of Alberta, a Social Justice Community of Service and Scholarship program is offered which includes a 3 hour lecture on Planetary Health, Climate Change and Social Justice, along with a self-directed community project. McGill University offers a selective (INDS 426) which consists of 8 climate change related topics. In the course, students submit a final project in which they address a sector of the healthcare industry's impact on climate and design a mitigation or resiliency strategy. The University of British Columbia includes a mandatory research course, Flexible Enhanced Learning, whereby students are able to partake in research of their choice. Students have participated in projects involving planetary health, including supporting the creation of a parks prescription program to encourage patients to spend time in nature, the creation of a survey to assess medical student interest on planetary health teaching, and the development of online educational modules intended to teach students and faculty about the various health effects of climate change (24). These opportunities offered at McGill University, University of Alberta, and University of British Columbia are electives, which are made available, but not mandatory for all students.

Recommendation #5: Collaborate with and learn from organizations and universities working on planetary health curricula initiatives. The diverse range of projects and curricular developments across Canada highlight the opportunity for schools to learn from each other and build off already formalized education material.

4. Areas for improvement within climate change undergraduate medical education curriculum

The 2021 National Report identifies areas that medical students would like to see improved in their medical school's planetary health curriculum. Adding material to a crowded curriculum can be difficult when trying to balance student workload with appropriate coverage of important material. A large number of respondents suggested it would be beneficial to integrate climate change education into pre-existing topics. Some patterns emerged among student working groups. The two most frequently raised topics which students wanted to learn more about were: sustainability in practice as physicians, and how climate impacts are linked to social determinants of health:

1. Environmental sustainability in clinical practice is an area across medical school curricula where students request more education. Many medical students have expressed the need for a greater emphasis on greening the healthcare system and resource stewardship in medicine. Students would like tangible teachings of what they can do as a medical student and as a physician, respectively, to practice climate-smart medicine. Some suggested that it would be helpful to learn from physician climate leaders in their community about what they do in their practice to reduce its ecological footprint. Other focus groups expressed the need for waste management education preceding clerkship.

Recommendation #6: Identify faculty or community leaders with expertise in healthcare sustainability and/or resource stewardship quality improvement in each medical school to meet medical student demand for sustainable healthcare learning opportunities.

2. Further teaching on the relationship between climate change and social determinants of health are also common themes suggested among working group responses. While some schools did report didactic lectures related to these connections, these opportunities are not present across medical school curricula.

Other ideas expressed in the survey include creating ties with environment and health related organizations for community based projects and offering a planetary health elective in clerkship.

Assessments of climate change across medical schools in Canada are in large part limited to a small number of multiple choice questions, if assessed at all. Some respondents suggest having more planetary health objectives incorporated into didactic lectures and problem-based learning to allow for a greater breadth of assessable content on planetary health and climate change. Students expressed that problem-based learning may lead to more engagement and active learning, and could serve as a means of assessment (i.e. participation or student evaluation by faculty facilitators). The need for assessment on planetary health learning within medical curriculum has been a focus for the CFMS HEART and is a driving factor in advocacy directed at the CACMS and the MCC. The proposed planetary health learning objectives for the MCC, based on the HEART Core Competencies, would guide medical schools to ensure that they are teaching medical students sufficiently to be licenced physicians.

Recommendation #7: With student and faculty input, and using available resources such as the CFMS HEART Planetary Health Competencies, medical schools must develop specific learning objectives throughout the duration of medical education to ensure medical students are adequately prepared to practice in a climate crisis.

5. Medical student leadership in extracurricular planetary health education

Many student-led initiatives at medical schools across Canada extend opportunities for education. Although the goal with this report is to provide an overview of how teachings on planetary health and climate change are incorporated into medical school curricula, it is important to address how curriculum is supplemented by student-led initiatives. Examining formal curricula alone would not give a full picture of how future physicians are educated on planetary health. Despite this, given the non-compulsory attitudes toward student-led, extracurricular initiatives, it is important that institutions continue to explore ways to increase planetary health incorporation into formal education.

In many cases, institutions support students through the creation of positions within student leadership in student governance and medical student societies. Three universities have opportunities for students as officers of sustainability within the medical student leadership structure.

SPOTLIGHT

University of Alberta

The Medical Student's Association Environmental Sustainability Representative position at the University of Alberta was created in 2017 to promote sustainability within the medical community. A mandate of the position is to collaborate with the CFMS HEART Committee.

Recommendation #8: Ensure there is high-level leadership and support for planetary health curriculum integration. Medical students are leading the development of curricular and extracurricular planetary health educational opportunities. Enhanced commitment from faculty and collaboration between faculty and students is required to meet the upswell of medical student interest in planetary health topics.

Environmental health interest groups are widespread across medical schools in Canada. These interest groups offer various lunch talks and lecture series at the local level which cover topics including climate change, nature and wellness, environmental policy, greening healthcare, and more. The COVID-19 pandemic has had variable effects on student-led clubs; some respondents mention their environmental health clubs have been less active in the past year. Others raise that previously in-person events were now delivered virtually. Increased virtualization of education through environmental health interest groups has made some learning opportunities more accessible to all Canadian medical students. The student-led environmental advocacy group, UBC EnviroMED, organizes frequent and interactive educational sessions on various topics of planetary health including climate change and disaster management, wildfires and climate change, vegan cooking sessions (nutrition and its effect on the environment), how to engage in climate advocacy as a physician, and how to counsel patients on the effects of climate change and health. Student interest groups also form a network of leaders capable of disseminating information across medical student bodies. This has made some national opportunities easily accessible across multiple medical schools. For example, a number of survey respondents mentioned the GreenMeds Speaker Series, which is organized by students at the University of Toronto, was made available nationwide.

SPOTLIGHT

University of Toronto

In 2021, the University of Toronto GreenMEDs team, in collaboration with the Centre for Sustainable Health Systems, created a speakers series called "Sustainability in Medicine" which was organized by students at the University at Toronto and made available nationwide. The speaker series consisted of 6 sessions in total ranging from 1-1.5 hours in length. The sessions covered a variety of topics including sustainable medicine in the primary care setting, sustainable medicine in the hospital setting, and advocacy approaches for sustainable healthcare. Students that attended a minimum of 4/6 sessions and wrote a reflection on their experiences were eligible to receive a certificate of completion.

STRENGTHS AND LIMITATIONS

It is important to interpret the results of this analysis with a critical eye and to acknowledge that there are limitations to this evaluation. Our team has benefited greatly from the insight provided by last year's survey and we hope to continue to improve on the process with each year's evaluation. In future iterations of this evaluation, our goals include: increased faculty input, more consistent student participation between schools (minimum focus group participants n=5), and improved clarity of the scope of the evaluation (including a clear definition of what is included under the umbrella of planetary health).

STRENGTHS

1. Inclusion of 17 out of 17 medical schools participating in the evaluation, with student input in 17/17 and faculty input in 7/17 schools.
2. 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.
3. Only evaluation of its kind in Canada. Entirely bilingual evaluation, ensuring inclusion of all English-speaking and French-speaking schools.
4. As this is the second year of the evaluation being implemented, this report provides insight into what has changed/been implemented over the past year.
5. Engaged student leaders in planetary health at each school, generating locally-informed insight into specific current and developing initiatives at each school.

LIMITATIONS

1. The participation and sample size of teams of student and faculty leaders in completing evaluations varied, limiting accuracy and comparability of results.
2. Typically respondents were students with a particular interest in planetary health. There were no inclusion/exclusion criteria for members of focus groups.
3. 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).
4. Incomplete faculty input, therefore potentially lacking insight regarding upcoming curriculum developments.
5. The possibility of variations in teaching between different sites at multisite schools was not accounted for.

STRENGTHS

LIMITATIONS

6. All surveys were analysed with an emphasis on identifying innovative directions in the delivery of planetary health education, any new changes in curriculum in comparison with the initial 2019 evaluation, and other avenues of future curricular improvement identified by our medical student informants

7. Provides a manual for schools across the country to learn from planetary health education developments happening at other schools.

6. The survey did not provide a strict definition for planetary health. This resulted in some information being reported regarding occupational health and other closely related fields that do not fall within the scope of this evaluation.

7. A number of universities were unable to complete the faculty survey, potentially due to pandemic-related increases in administrative workload and clinical responsibilities in 2021.

CONCLUSION

Schools across Canada have demonstrated progress in the integration of planetary health competencies into undergraduate medical education programs. This must be acknowledged, particularly given the challenges of the transition to virtual medical education in 2020 as a result of the COVID-19 pandemic. However, there is still significant progress that needs to be made to ensure medical students provide optimal care for patients whose health (and healthcare systems) will be increasingly impacted by the climate crisis.

The inclusion of planetary health curriculum within strategic planning at medical schools signals the growing awareness among medical school leadership of the scale of societal changes needed to address climate change. However, from the curriculum survey we see that medical student leaders are consistently spearheading the implementation of both curricular and extracurricular planetary health education. While students are invaluable leaders that must be included in this work, it is critical that there is high-level leadership on these issues at all medical schools in order for progress to be maintained.

The recommendations highlighted in this report provide insight into areas of opportunity for strengthening planetary health education in Canadian medical schools. As trusted professionals, physicians have a key role to play in climate change mitigation and adaptation within the healthcare system. Continued progress in planetary health medical education is necessary to prepare the next generation of physicians to face the challenges ahead.

ACKNOWLEDGEMENTS

Medical schools across Canada have seen an increase in planetary health teaching in 2020. We are fortunate to have the support of faculty members and medical student colleagues who realize this is a collaborative effort, and continue to leverage each other's goals. We want to acknowledge that this year was a particularly difficult year for faculty and students to take time to respond to our extensive survey. Thank you to all the faculty and students who took time to answer the survey.

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 for initial creation of the survey 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

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APPENDIX: 2019 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.

Link to 2019 Report:

<https://www.cfms.org/files/HEART/CFMS%20HEART%20REPORT%20Final.pdf>