

Putting planetary health at the core of the medical curriculum in Amsterdam



Health systems urgently need to transform and build resilience against the consequences of climate change.¹ The future and the current health workforces have an essential role in this process and, to effectively capacitate them, researchers have called for the inclusion of planetary health in the medical curriculum.^{2,3} However, in 2020, only 15% of surveyed medical schools worldwide had incorporated elements of climate change in their curricula.⁴ Heeding the need for change, a multidisciplinary team at the University of Amsterdam (Amsterdam, the Netherlands), comprising a public health physician, an anaesthesiologist, a gynaecologist, a paediatrician, and a final-year medical student, came together to set up a module on planetary health with the aim of integrating this topic in everyday clinical practice. Through a multidisciplinary and intergenerational approach, the team ensured consideration of diverse perspectives in the development process of the module.

During the module, teachers prompt students to think about their role in the context of planetary health, for three main reasons. First, the module aims to improve climate literacy and encourage students to share their innovative ideas, thoughts, insights, and solutions. Second, climate change poses an increasing mental health threat because of stress and anxiety, affecting young people most.⁵ In addition to knowledge of issues associated with climate change, tools that stimulate solution-based thinking and improve mental health are beneficial. Finally, this approach also aims to stimulate reflection on students' role in building a climate-conscious, resilient, and environmentally sustainable health workforce, ultimately contributing to planetary health.

The module and its contents were developed in January, 2021, via the application of several educational concepts, including blended learning, the flipped classroom, and Bloom's taxonomy.⁶⁻⁸ Medical education at the University of Amsterdam consists of a Bachelor phase of 3 years and a Master phase of 3 years, with the Master phase alternating between theoretical sections and clinical rotations. The module on planetary health was developed for the Master phase and is embedded in the mandatory longitudinal theme of prevention

and social accountability. The module spans 6 h, with different lectures scheduled in various sections of the clinical phase. A practical assignment ensures that the theory is integrated with existing rotations throughout. An overview of the contents can be found in the table and the detailed module toolkit and syllabi are given in the appendix.

See Online for appendix

Overall, the module comprises three elements that span the themes of planetary health, sustainable health care, and climate change and health. During the first element of the module, students are introduced to the concept of planetary health in an engaging manner by applying different modes of asynchronous learning,

	Learning format	Description
Element 1: introduction to planetary health (year 4)		
Getting started	Home study	Definition of planetary health and video to introduce the topic
Deepening the knowledge	Home study	Article on planetary health to further explore the topic
Reflection	Home study	Reflective questions after the video and article
Sustainability	Home study	Students read and prepare the assignment
Element 2: towards sustainable health care (years 4 and 5)		
Introduction	Home study	Students learn the basic components of the footprint of the operating room via e-learning
Recapitulation of home study	Seminar	Short recap of the footprint of the operating room, complemented by examples from the Amsterdam University Medical Centers hospitals
Deepening the knowledge	Seminar	Discussion among students about their views on sustainability
Observation assignment	Group assignment	In the hospital, during their clinical rotations, students observe a situation that could be improved from a sustainability perspective; the results are added to their personal portfolio and are presented in Element 3
Element 3: climate change and health (year 5)		
The basics	Home study	Video with basic explanation of climate change; for many students this video will be a recap
Introduction	Home study	Introduction of the direct and indirect associations of climate change with health
Deepening the knowledge	Home study	Deepening the understanding of the association between climate change and health, including inequities
Application	Group assignment	Creation of infographics; each group explores one health domain and its association with climate change
Presentation	Seminar	Infographics and observation assignments are briefly shared, and questions briefly discussed
Discussion	Seminar	Discussion of health-care professionals' role and responsibility
Concluding comments	Seminar	Climate change as an opportunity; discussion of what has been learned and offering of additional tools

Table: Contents overview of the planetary health module at the University of Amsterdam and its integration in the medical curriculum

including videos, reading materials, and thought-provoking questions. Students are encouraged to start thinking about their role and responsibilities as future health-care professionals and the relationship between human health and the health of our planet.

For the second element of the module—towards sustainable health care—students are challenged to think about solutions for an environmentally sustainable provision of health care in a specific clinical context. The focus is on the operating room and patients undergoing surgery because this session is planned just before surgery rotation. Specialists with direct practical experience in making their departments more sustainable lead the discussions. Strong statements about sustainability are displayed, with students forming groups on the basis of their attitude towards the subject. This approach enriches the quality of the short contact time between specialists and students to reach beyond simple knowledge transfer. At the end of this element, students are given an observation assignment for their coming rotations. In groups of six, students are required to describe a situation in the hospital that could be improved from a sustainability perspective. The Defects, Overproduction, Transportation, Waiting, Inventory, Motion, Processing, and Products tool is recommended to identify sources of waste, as it systematically assesses a process and categorises it into the eight mentioned categories. The results from this observation are added to the students' personal portfolio and each group then presents their findings.

During the third element of the module, which takes place in the fifth year of the medical curriculum, students learn about the link between climate change and health in more detail. After a more detailed study of the topic using videos and articles, the students are divided into small groups to illustrate a specific domain with an infographic. The different domains are areas relevant to the clinical context, tailored to the Netherlands, and comprise infectious diseases, non-communicable diseases, temperature-related health impacts, extreme weather, malnutrition, and mental health. The groups present the infographics, followed by a discussion on inequities. Students are then challenged to think about their individual roles and the role of the wider health workforce. At the end of the module, the groups summarise all planetary health elements using a flipped classroom principle, with the teacher pointing

out further readings, including resources and tools for (future) physicians.

The current module is only the start of the integration of planetary health in the medical curriculum at the University of Amsterdam. The module will be evaluated constantly and updated with continuous input from the students. Further efforts are ongoing to increase and broaden the implementation of planetary health in the curriculum. Three additional elements are being developed to integrate planetary health with obstetrics and gynaecology, and paediatrics rotations.

During these additional elements of the module, the students will be challenged to reflect on their behaviour through a self-observation tool that tracks actions such as the unnecessary use of single use plastic, the type of transportation to the hospital, and the use of video consultations. The awareness created by this tool will inspire collective actions and lead to systematic change. The observations will then be discussed and students will be challenged to give feedback on sustainable behaviour and planetary health. This approach will further empower students to use their voice in the climate debate. Finally, students will be asked to present their progress on the self-observation assignment in the final sessions of the module.

In conclusion, the integration of planetary health in the medical curriculum at the University of Amsterdam is ongoing and timely, as further supported by a national letter from young doctors and medical students to the Dutch Government, which calls for planetary health to become a main priority in medical education.⁹ The module on planetary health can inform and empower future health professionals to ensure urgent and innovative actions from the health sector on mitigation and adaptation to climate change. Furthermore, the module is openly shared to serve as an example for medical curricula worldwide and stimulate the integration of planetary health and climate change into the competencies of future health workers. In the face of the urgent need for building a health workforce with these essential competencies, the sharing of resources and insights every step of the way is crucial.

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