



Research Report

Climate Change &
Sustainability

De Geneeskundestudent



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Abstract

In 2021, De Geneeskundestudent (DG) published a report based on its survey from 2020/2021 on the views of Dutch medical students regarding climate change and health, as well as the sustainability of the healthcare sector. In 2022, this research was repeated, the findings of which are described in this report.

Since the publication of the previous report, climate change remains to be the greatest societal health threat of the century. Moreover, with the right knowledge and tools, physicians can play a significant role in turning this health threat into a major health opportunity. An important development lies in the incorporation of a core rule in the revised code of conduct by the Royal Dutch Medical Association (KNMG) addressing the responsibility of physicians towards a sustainable healthcare sector and the relationship between health, climate, and the environment. Additionally, a new Green Deal Working Together towards Sustainable Healthcare was published in November 2022. Therefore, in 2022, further research was conducted among medical students, the physicians of the future, to assess their perspectives on health and climate change and the state of education on this topic.

DG conducted a digital survey among medical students and recent graduates – in the past six months – from the eight Dutch medical faculties. The sustainability-related survey questions were answered by 2,018 respondents, who were evenly distributed across various universities and academic years. A substantial proportion of the respondents believes that physicians have an important role in making healthcare more sustainable and emphasising the health risks of climate change in the climate debate. At the same time, the majority of respondents feel that there is currently insufficient attention given to the health risks of climate change and the sustainability of healthcare in the medical curriculum. According to the respondents, universities should take responsibility for imparting basic knowledge of Planetary Health to future physicians. A significant number of medical students are already involved in making the healthcare sector and/or medical education more sustainable.

In this report, DG formulates various recommendations, building on those from the 2021 report, to address the request from future physicians in the Netherlands to integrate Planetary Health into the medical curriculum, so that physicians can fulfill their responsibility in mitigating the health risks of climate change and making healthcare more sustainable.

1 Introduction

In 2020/2021, DG assessed the perspectives of medical students on climate change and health, the sustainability of healthcare, the responsibility of physicians in this, and the integration of climate education into the medical curriculum. The research report provided recommendations to stakeholders on how to implement the vision of medical students. In 2022, De Geneeskundestudent conducted a follow-up study to evaluate the developments that have taken place since the publication of that report.

The findings from the 2020/2021 study indicated that medical students attribute a responsibility to physicians to emphasise the health effects of climate change. According to the World Health Organization (WHO) and The Lancet, climate change remains the greatest health challenge and opportunity of the century for society (WHO) (Romanello)¹. For instance, global warming can worsen pulmonary and cardiovascular conditions due to decreased air quality and increase the risk of adverse pregnancy outcomes and impaired child development (Johnson NM). Conversely, adopting a more plant-based diet leads to reduced CO₂ emissions and diminishes disease burden of for example diabetes and cardiovascular diseases (Trautwein EA).

The 2020/2021 research respondents also perceived a role for physicians in making the healthcare sector more sustainable. However, recent studies indicate that the healthcare sector is still responsible for 7% of greenhouse gas emissions in the Netherlands in 2022 (Steenmeijer), a percentage unchanged compared to the contribution estimated in 2019 (Strategists, Gupta).

Furthermore, the 2020/2021 research revealed the desire of medical students for climate education to be integrated into the curriculum, as the health effects of climate change were found to be inadequately covered in the Dutch medical curriculum.

“The healthcare sector still has substantial progress to make in achieving a balance between greenhouse gas emissions and removals”

Climate change continues to pose a significant threat to public health. Moreover, the healthcare sector still has substantial progress to make in achieving a balance between greenhouse gas emissions and removals, aiming for a “net-zero” state. Hence, two years after its initial research report on this theme, De Geneeskundestudent investigated the perspectives of students on climate change and health. Furthermore, the initial research report provided recommendations for the integration of climate education into the medical curriculum. Therefore the current research also evaluated the developments regarding the integration of climate education into the medical curriculum. (De Geneeskundestudent)

¹Greatest health opportunity of this century: By taking action to mitigate climate change, significant (preventive) health benefits can be achieved simultaneously. These are often referred to as “co-benefits.”

Some additional examples:

- Transitioning to a more plant-based diet: reduces methane emissions from livestock and is beneficial for human health (reduces cancer, diabetes, and cardiovascular diseases).
- Increasing walking and cycling (active transportation) instead of using cars (passive transportation): reduces CO2 emissions, improves physical fitness (more exercise), and enhances air quality (reduces pulmonary and cardiovascular diseases).
- Creating more green spaces in cities: helps counteract urban heat island effects, improves mental health, and encourages physical activity.

2 Methods

Study Design and Participants

De Geneeskundestudent (DG) conducted a digital survey among its members. DG is the national, independent representative of approximately 15,000 medical students in the Netherlands. It aims to advocate for the best possible healthcare professionals in the future by providing optimal representation and support to students. The survey was available from October 17, 2022, to December 12, 2022. All members registered as medical students at one of the eight medical faculties, in the bachelor or master phase, or within 6 months of graduation, were invited to participate.

New topics in the survey included career support, extramural specialties, diversity, training capacity (opleidingscapaciteit), and sustainability. The questions related to other topics (career choice, inappropriate behaviour (ongewenst gedrag), mental exhaustion, time allocation, education and personal situation) were kept as similar as possible to previous surveys and were simplified where necessary. The questions were developed by project groups and were reviewed by the General Board of DG and individuals with research experience for feedback on content and comprehension. After a testing phase, the questions were finalised.

Procedure and Data Collection

DG conducted the survey online using SurveyMonkey, a paid cloud-based application for designing, distributing, and analysing surveys. Invitations were sent multiple times via email, the DG website, and social media. After the deadline for submission passed, the questionnaire was closed. The survey consisted of a maximum of 71 questions, including follow-up questions and questions to differentiate between subgroups. For each participant, several demographic data points were collected first (academic year, university, gender identity), followed by the various themes of the questionnaire in a predetermined order. Some questions were presented or skipped based on previous answers, so not everyone had to answer all the questions.

Eight questions were asked about the theme of sustainability. Questions were posed regarding awareness of climate change and associated risks, the appreciation of sustainability education, and the role of physicians and involvement in sustainability.

Data Analysis and General Characteristics

The analysis was conducted using the SurveyMonkey tool and Excel. Data analysis was anonymous. Categorical data were presented as absolute numbers (n) and percentages (%). When applicable, the mean was presented for numerical data.

The survey was completed by 2,647 respondents. A data quality check was performed, resulting in the removal of one respondent. Incomplete responses were included. The average age of the respondents is 22 years. The majority of respondents (87.2%) are between 18 and 25 years old, followed by 10.2% who are between 26 and 29 years old. Furthermore, 46.8% of the respondents are bachelor students, 50.7% are master students, and 2.5% graduated within the past 6 months. 76.6% of the respondents are female. The survey was most frequently completed by students from Erasmus University and Radboud University and least frequently by students from the University of Amsterdam and Vrije Universiteit.

Privacy

DG informed all respondents about the purpose of the survey before its commencement. Consent was obtained to collect, store, and anonymously analyse the data in accordance with the General Data Protection Regulation (GDPR) (Algemene verordening Gegevensbescherming, AVG in Dutch). Participation was voluntary and could be terminated at any time.

3 Results

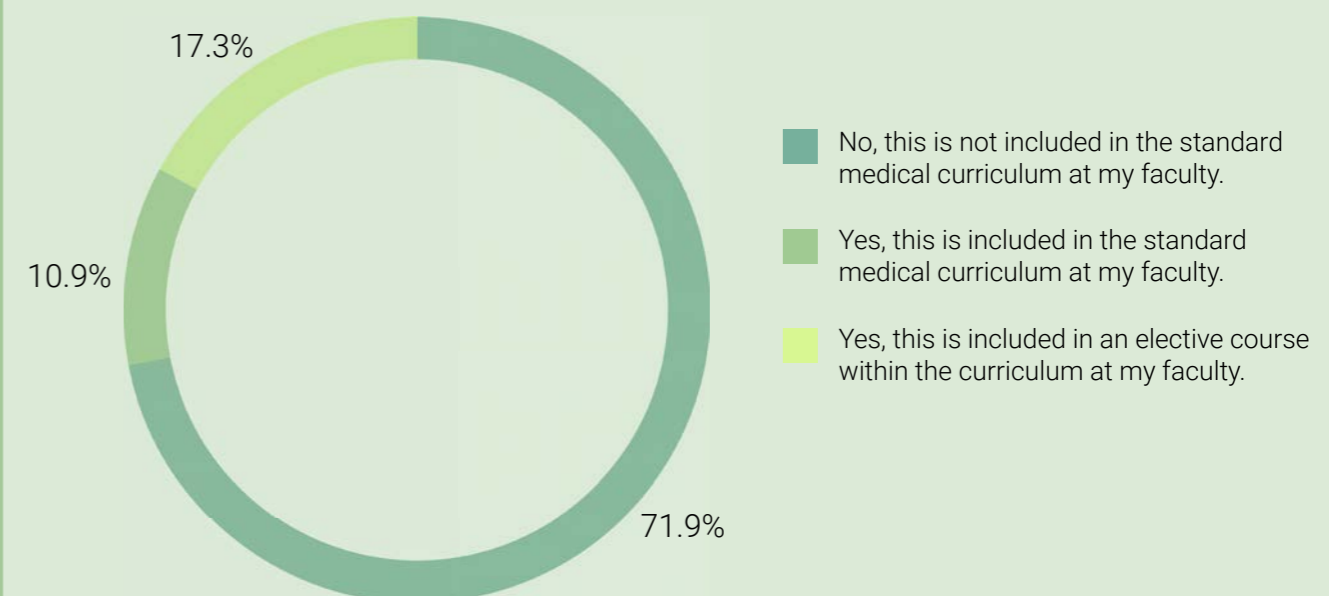
The survey was completed by 2,647 medical students, of which 2,108 (80%) filled out the survey questions related to sustainability. The respondents were evenly distributed across various universities and academic years. There were no significant differences between male and female respondents or between medical students from different universities.

Education and Knowledge

Among all students, 8% (n=165) indicated that their education had addressed the health risks of climate change. Simultaneously, 26% (n=525) stated that they had no knowledge at all in this area. The majority of students (47%, n=948) reported having obtained information about the health risks from other sources than their formal education, whereas 19% (n=383) of students learned about the health risks of climate change both through their curriculum and other sources.

Regarding the curriculum, 72% (n=1453) of students reported the absence of educational sessions on the health risks of climate change. Of the students who received education on this topic (28%), 17% received it as part of the standard curriculum, and 11% as an elective course.

Figure 1 Are there educational sessions in your curriculum, such as lectures, tutorials, and practical sessions, about the health risks of climate change?



72%

(n=1453) of students indicate that there are no educational sessions about the health risks of climate change in the curriculum.

76%

(n=1534) of all students believe that there should be more emphasis on this subject in the medical curriculum.

At the same time, 76% of all students (n=1534) believed that there should be more emphasis on this topic in the medical curriculum, while 18% (n=363) expressed a neutral stance. Regarding sustainability in healthcare, 60% of students (n=1211) expressed that there was insufficient attention given to it in their medical curriculum, while 24% (n=484) had a neutral opinion. Moreover, 71% (n=1433) believed that universities should take responsibility for imparting basic knowledge of Planetary Health to future physicians, with 23% (n=464) having a neutral stance.

Engagement in Sustainability

Furthermore, 73% (n=1473) of medical students reported involvement in sustainability efforts within healthcare and/or medical education. Among them, 64% (n=1292) are engaged at a personal level (individual actions), 4% (n=78) are involved at an organisational level, and 5% (n=102) are engaged in both aspects. On the other hand, 27% (n=545) of students reported no involvement in sustainability efforts. 63% (n=1265) would like to know more about the possibilities for increasing their engagement. Of those not involved, 44% (n=245) cited insufficient knowledge as the main reason.

Figure 2 Not involved in sustainability because?

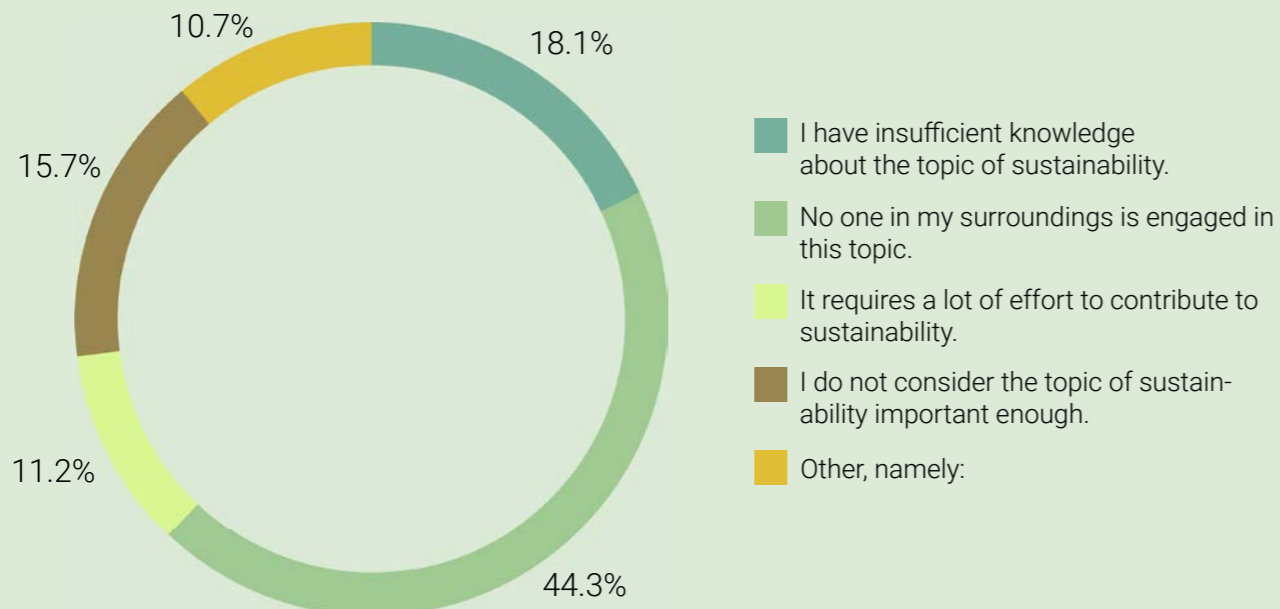
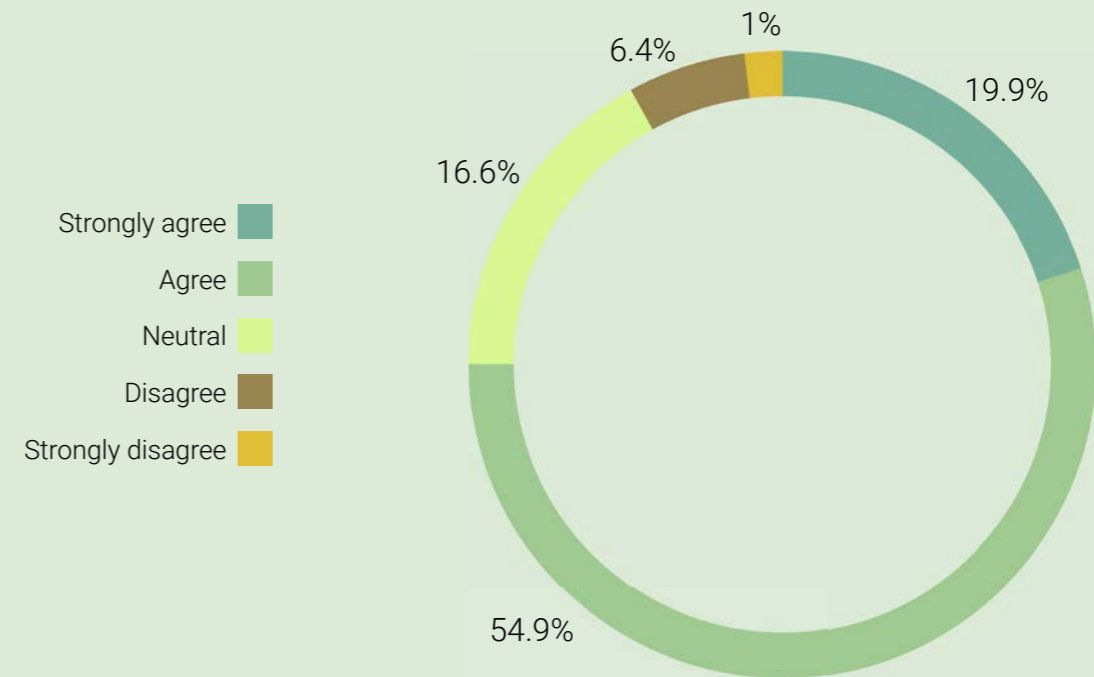


Figure 3 Physicians have an important role in making healthcare more sustainable, for example, through initiatives such as waste reduction in operating rooms (ORs) and prescribing more sustainable medications/treatment options.



Role of Physicians

The results revealed that 76% (n=1534) of medical students believed that physicians have an important role in making healthcare more sustainable, with 17% (n=343) expressing a neutral stance and 8% (n=161) disagreeing. Additionally, 66% (n=1332) believed that physicians have a responsibility to emphasise the health risks of climate change in the climate debate. Meanwhile, 26% (n=525) had a neutral stance, and 9% (n=182) disagreed.

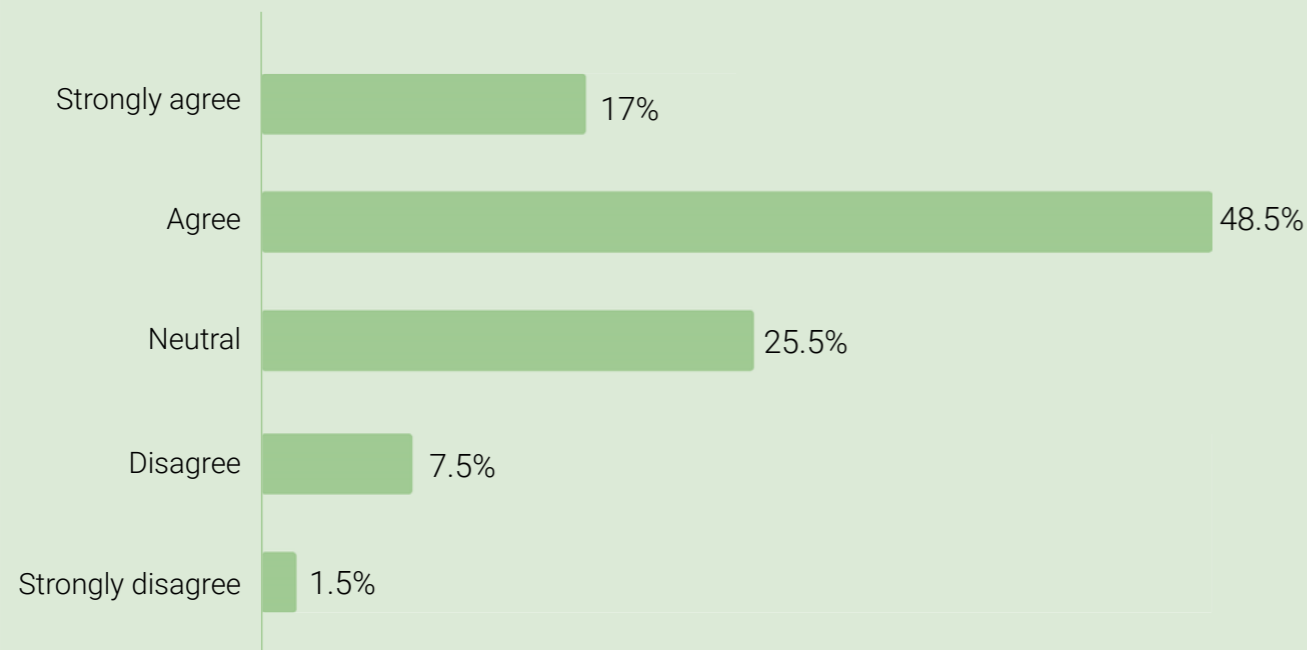
Plant-Based Diet and Health

Regarding dietary choices, 44% (n=888) of students agreed that it is beneficial for medical students and physicians to advise their patients to consume a predominantly plant-based diet, according to The Lancet Planetary Health Diet, to promote their own health and the health of the planet (EAT-Lancet). A neutral

“66% of medical students believe that physicians have a responsibility to emphasise the health risks of climate change in the climate debate.”

stance was expressed by 34% (n=686), and 21% (n=429) disagreed with this statement. Moreover, 52% (n=1049) of medical students believed that hospitals should offer predominantly plant-based food options, according to The Lancet Planetary Health Diet, with 28% (n=565) expressing a neutral stance.

Figure 4 Physicians have a responsibility to emphasise the importance of health risks related to climate change in the climate debate.



4 Discussion

The results of the national survey show that medical students believe there is a responsibility for physicians within both the climate debate and the sustainability of healthcare. Medical students would like to see education on healthcare sustainability and the health impacts of climate change integrated into the curricula. This mindset aligns with the findings from the survey of 2020/2021.

What do students want?

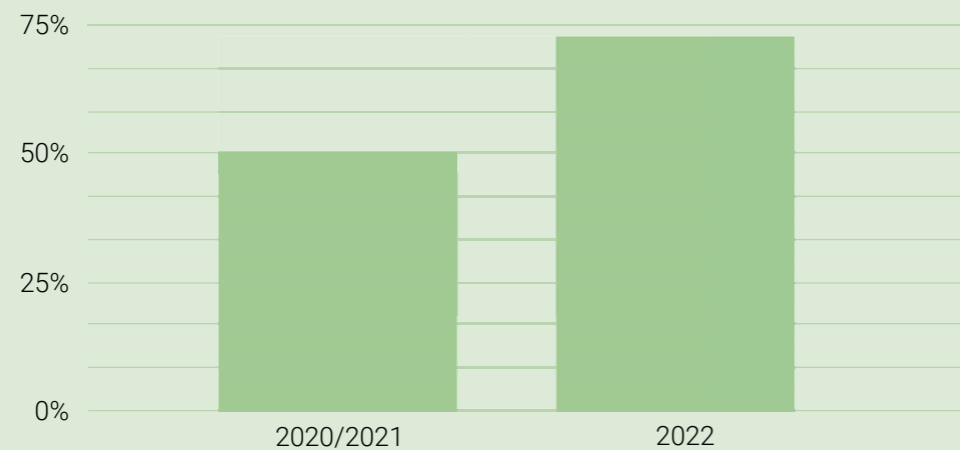
Similar to the previous survey, about a quarter of the students lack knowledge about the health risks of climate change. The vast majority of those who do have knowledge, obtained it outside of their formal studies. The survey results indicate that most curricula currently do not include any educational moments on this topic. Among the small group of students (28%) who did receive education on the subject, only about two-thirds of them found it to be a part of the standard curriculum. A selective group (approximately one-third of the 28%) received this education as an elective course.

The fact that the current medical curricula in the Netherlands lack sufficient attention to Planetary Health (including Climate Change and Health) and sustainability is consistent with a research report published in 2022 by GREENER, the multidisciplinary expert group in the field of sustainability and medical education.

As expected, the vast majority of students (76%) believe that there should be more focus on climate change and its health risks in the medical curriculum. This desire has even increased slightly compared to the previous survey (2020/2021), where it was 72%. Additionally, 60% of the students feel that there is currently insufficient attention to sustainability in healthcare within the curricula.

A significant proportion of medical students (73%) are personally and/or organizationally involved in the sustainability of healthcare and/or medical education. This has significantly increased compared to 2020/2021, where only half of the students were involved. However, more than half of the students still wish to know more about how to increase their involvement. The most commonly cited reason for not being involved at present is a lack of knowledge. In a world where rapid sustainability across all sectors is crucial, this highlights the urgency of incorporating education on sustainability and climate topics. (De Geneeskundestudent)

Figure 5 Comparison of the percentage of students involved in sustainability (2020/2021 survey and 2022 survey)



Implementation in medical curricula

To demonstrate that Planetary Health is related to various aspects of health and to emphasise its importance, several publications and GREENER recommend integrating education on this topic throughout the entire curriculum (Tun) (Hackett F) (Teherani A).

In the guidelines provided by IFMSA-NL, GREENER, and MINT Zorgadvies, a step-by-step plan is described. In the short term (approximately one month), an introductory lecture and implementation can take place with willing instructors. Simultaneously, in the medium term (6 months to one year), Planetary Health education can be integrated longitudinally into all relevant themes within the medical program. In the longer term (more than one year), previously implemented Planetary Health education can be professionalised and institutionalised, and in-depth education can be added, such as an elective course or elective clerkship in Planetary Health. (GREENER)

“The involvement of students in the development of a sustainable curriculum has been described as a successful approach.”

A uniform approach is necessary to equip all future physicians with the required knowledge and skills. Involving students in the development of a sustainable curriculum has been described as a successful approach to realising such education, and this method is already being applied in various faculties in the Netherlands (Hackett F) (Tun SM).

Physicians and prevention

This report strengthens the call for physicians to act as promoters of health for both climate and well-being, as described in the literature and by international medical organisations at individual and societal levels (Watts N) (Maxwell J) (British Medical Association) (Australian Medical Association) (Medical Society Consortium on Climate and Health, U.S.). In recent years, various initiatives in the Netherlands have also seen an increasing number of physicians drawing attention to climate change and the sustainability of healthcare (Regiegroep Duurzame Zorg) (Werkgroep Zorg 2025) (Milieuplatform Zorgsector).

The results of the survey demonstrate that taking up this responsibility is highly necessary and should be done together with the physicians of the future. The medical students currently being trained will encounter the consequences of climate change during their careers more than the current generation of doctors. These health impacts, combined with factors such as ageing, an increase in overweight and obesity, deteriorating mental health in young people, and more children growing up in poverty, will lead to a significant increase in demand for healthcare services (KNMG). In a sector already plagued by burnout, drastic measures are needed to maintain manageable workloads (KNMG). An integrated approach within public health, with a focus on disease prevention, is essential. Within this approach, there are ‘co-benefits,’ meaning actions that are beneficial for both public health and the climate. Examples of such actions include transitioning away from fossil fuels and coal to improve air quality and adopting The Lancet Planetary health diet, which simultaneously addresses climate change and leads to a 23% reduction in global disease burden (Act4Health) (Haines).

“Physicians should be a partner in climate and prevention policies.”

In this integrated approach, physicians must play a significant role as partners in climate and prevention policies, with the government involving them to promote climate and health together.

Strengths and Limitations

This current survey conducted by De Geneeskundestudent highlights the importance attached by medical students in the Netherlands to the health effects of climate change and the sustainability of healthcare. One possible limitation is that socially motivated students might fill out the survey in proportionally larger numbers compared to less involved students. However, the large number and equal distribution of respondents, along with the substantial response rate and the fact that the topic was part of a broader survey sent to all members of DG, make this less likely and reinforce the relevance of the findings. Furthermore, the correlation of the current survey data with the data from the previous survey also supports this relevance. (De Geneeskundestudent)

5 Developments

As explicitly stated in the revised KNMG code of conduct for physicians: “As a physician, you are aware of the relationship between health, climate, and the environment. You are committed to a sustainable healthcare sector and a healthy living environment” (KNMG). Many medical students recognize this significant societal role and are eager to be prepared to take on this responsibility.

In November 2022, the latest Green Deal C-238 “Samen Werken aan Duurzame Zorg” (Working Together for Sustainable Healthcare) was published, outlining goals and actions for the period from 2023 to 2026. This Green Deal was signed by various parties, including the Dutch Federation of University Medical Centers (NFU), medical professional organisations, and De Geneeskundestudent.

One of the five objectives to which these parties commit is “Increasing awareness and knowledge.” Within this objective, the following commitment from the parties is mentioned: “Parties promote the integral integration of sustainable healthcare and Planetary Health in the curriculum of all healthcare education programs. Branch and umbrella organisations and healthcare providers make agreements with educators on how to consistently and effectively incorporate these themes into healthcare education”. (Green Deal)

This aligns with the vision of De Geneeskundestudent, which emphasises that universities should take responsibility for imparting foundational knowledge of Planetary Health to future medical graduates. Currently, knowledge about Planetary Health and the sustainability of healthcare is not included in the “Raamplan Artsopleiding” (Framework for Medical Education), which is formulated by the Dutch Federation of University Medical Centers (NFU). (NFU)

In addition to committing to education on sustainability and Planetary Health, other outcomes of this research report align with the agreements from the Green Deal C-238. For instance, within Green Deal C-238, it was agreed that the healthcare sector actively contributes to the societal debate on the relationship between human actions, climate change, environmental pollution, a healthy living environment, and health. Moreover, parties involved in the Green Deal aim to promote greater awareness among patients regarding the relationship between climate, environment, and health. Practical information will be provided to help patients and healthcare providers adopt sustainable practices. Furthermore, there will be a transition towards more plant-based food for staff and visitors within the healthcare facilities. (Green Deal)

6 Conclusion

The results once again indicate that future physicians in the Netherlands see a role and responsibility for physicians regarding the health risks of climate change. At the same time, students state that despite the demand, no substantial changes have occurred in the amount of education on this topic. Interestingly, while education lags behind, student attention to the subject has increased.

Many medical students would like to see Planetary Health integrated into the medical curriculum by universities and to be taught about their role in promoting sustainability in healthcare. The insights from this survey underline the importance for physicians (in training), educators, and representative organisations to assume and promote the role of health promoters for climate and health.

7 Recommendations

Based on the results of the digital survey conducted by De Geneeskundestudent (DG) among medical students at each of the eight medical faculties in the Netherlands, several recommendations are made. These recommendations are ranked based on priority and expected impact. Regardless of the recipient, DG emphasises the urgency of adopting and promoting the role of “health promoter for climate and health” for physicians (in training), educators, and representative organisations.

01 Addressed to the NFU and the eight medical faculties

DG advises explicitly incorporating sustainability in healthcare and the health effects of climate change into the current Framework for Medical Education (Raamplan Artsopleiding). Furthermore, it is recommended to fully implement this in the medical curriculum, following the Green Deal C-238 “Working Together for Sustainable Care” (“Samen Werken aan Duurzame zorg”). This way, physicians in the Netherlands will be uniformly equipped with the relevant knowledge and skills. Involving students in the development of medical education focused on sustainability and the sustainability of faculties and academic hospitals is an opportunity and a requirement.

02 Addressed to the government, the Parliament, the Ministry of Economic Affairs and Climate Policy (Ministerie van AZK), and the Ministry of Health, Welfare, and Sport (Ministerie van VWS)

It is recommended to include healthcare professionals in the expert groups that have a say in the development of comprehensive climate and prevention policies. This recommendation is made because certain interventions (such as those aimed at reducing air pollution) have both positive effects on the environment and public health.

03 Addressed to the Royal Dutch Medical Association (KNMG) and (young) physicians' organisations

It is recommended to emphasise climate, health, and prioritisation of sustainability in healthcare. Formulating and promoting explicit opinions can serve as a call for decisive policies and actions. This way, both the politicians and their own constituencies can be made aware of the responsibility and opportunities for health promotion through individual and societal approaches to climate change and the sustainability of healthcare.

04 Addressed to DG herself, medical student organisations, and individual medical students

DG advises to continue seeking connections with local and national parties committed to the topic of sustainability, such as the Green Care Alliance (Groene Zorg Alliantie), MED-ZERO, and GREENER. It is recommended to join faculty green teams and/or groups working on integrating sustainability in the medical curriculum, the faculty, and the hospital. It is important for future physicians to take the initiative to pursue internal sustainability, to make sustainability a central focus in long-term policies, and to make climate-conscious choices on a daily basis. DG has taken a pioneering role in this regard and is willing to share its experiences with fellow stakeholders.

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