

## Sustainable Healthcare Education Case Studies 2016-17

This document will support educators wishing to develop their curriculum in line with the new GMC 'Outcomes for Graduates', which requires medical graduates to 'evaluate the role' of ecological hazards in ill-health, outline principles of sustainable healthcare, and apply the principles, methods and knowledge of sustainable healthcare to medical practice. (1) Learning in line with these GMC outcomes, about environmental change, ecological hazards affecting health, sustainable healthcare and related topics we refer to throughout this document as 'sustainable healthcare education'.

Case studies from 2016/17 onwards from eight medical and health professional schools in the UK, Brazil and USA build on CSH's 2011/2012 report which documented case studies from eight UK medical schools. (2) The case studies were collected via an email survey and telephone interviews. They represent successful integration of sustainable healthcare education, where evaluations completed by students have indicated that their knowledge and attitudes have been positively influenced. A variety of pedagogies and formats are used to facilitate sustainable healthcare education.

### Why environmental issues are relevant to doctors and other health professionals

The Global Consensus on Social Accountability states that health professionals must play a role in addressing current and future health threats. (5) The General Medical Council in the UK states that it is the duty of the doctor to improve the health of patients and the public, (4) and has recently incorporated new learning outcomes for medical graduates that explicitly require knowledge of ecological determinants of health and the ability to apply principles of sustainable healthcare. (1)

The negative impacts of environmental change on health are already in evidence across the world and are the subject of much ongoing research. In 2009, the Lancet Commission on Climate Change and Health dubbed climate change, "the greatest threat to global health of the 21<sup>st</sup> century". (6) The subsequent 2015 report found that while climate change is a major health threat, tackling it provides the greatest opportunity that humans have to improve global health. Teaching students about climate change and sustainability not only guards against huge health costs of environmental degradation, it also contributes to developing a health care profession that is informed, engaged and ready to help to achieve in the incalculable bonus to human health that arises from building more sustainable societies. In the words of the Lancet commission, "climate change is fundamentally an issue of human health, and health professionals have a vital role to play in accelerating progress on mitigation and adaption policies." (7)

### Taking sustainable healthcare education forward

Equipping medical and healthcare students with sustainable healthcare competence at the beginning of their professional journey will enable them to incorporate good practice into their professional practice. (3) We hope that educators around the world can draw from these varied examples to identify how sustainability can be built into their own teaching and curricula. We include contact details of the different medical schools to facilitate discussion and collaboration for curriculum development. We are also happy to be contacted: [frances.mortimer@sustainablehealthcare.org.uk](mailto:frances.mortimer@sustainablehealthcare.org.uk)

## Bristol Medical School, UK

### Summary

Bristol Medical School ran a ten-week module involving theoretical and active learning to enable students to realise the practical implications of the concept of sustainable healthcare. The students were taught by specialists from the Centre for Sustainable Healthcare and the NUS' Department for Sustainability. Their learning was complemented by a placement in a local GP (general practice) surgery or NHS trust, where they delivered, monitored and evaluated a project designed to improve quality or help achieve actions within the Green Impact toolkit ([www.nus.org.uk/greenimpact](http://www.nus.org.uk/greenimpact)).

### Course Description

2<sup>nd</sup> year students were given the opportunity to engage in this student selected module which uses Green Impact for Health (NUS' framework of actions that GP surgeries can take to improve their sustainability, quality and efficiency) as a framework. The module engages students at the beginning of their career, enabling them to promote sustainable behaviours to contribute to a new, more sustainable culture in healthcare organisations.

The module gives students a background in sustainable healthcare, climate change, quality improvement and change management; issues that all practitioners in health and social care require an understanding of. Students are then placed within a healthcare organisation to develop and complete a project addressing an area that they feel particularly strongly about, using a quality improvement methodology. Projects ranged from reducing disposable glove use, streamlining referral and support streams for obese children, establishing new exercise classes for social prescribing and creating awareness videos for patients about air quality.

Assessment for the module has varied across different years but has included verbal presentations, learning reflections and essays describing their project.

*Course dates:* October - December (the course ran from 2014 – 2017, from 2018 a new format will be used to meet the University of Bristol's requirements)

*Pedagogical format:* A mixture of lectures, seminars, self-facilitated learning, peer-to-peer learning and a practice based project

*Teaching time:* 30 hours (9 hours used specifically for teaching)

*Number of students taught:* 6-10 per module

### Lessons Learned:

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- External experts delivering the module (Charlotte Bonner from the National Union of Students and Dr Frances Mortimer from the Centre for Sustainable Healthcare) represented both an opportunity and a challenge. The opportunity arises from their perspective and experience of practising and teaching about sustainable healthcare; the challenge is ensuring alignment of their teaching both in terms of logistics and in terms of the aims and pedagogies of the module and the medical school.
- Student feedback suggests that students want to learn about sustainability if it is framed such that they can relate it to other core curriculum topics, such as health service delivery, and to their own personal interests, such as social justice and the future of the NHS.
- Tasks that seem doable to practitioners with experience of integrating sustainability into healthcare practice may be incredibly difficult for students just starting out on the journey – we need to reign in our expectations and take into account the other pressures students are experiencing! Similarly managing student expectations as to what is achievable in ten weeks needs to be done carefully.

#### Sustainability learning outcomes addressed:

- PLO 1 - Describe how the environment and human health interact at different levels
- PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems
  - Understand the wider concept of sustainability including social, economic and environmental sustainability and how it relates to healthcare
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment

#### Students said:

“This SSC was a great addition to my medical course, it was a lot of work at times, but I felt like I have really made a difference, and due to the nature of my project I felt like I was acting a professional in the NHS which was very exciting and rewarding.”

“This SSC has been a great opportunity...I have thoroughly enjoyed exploring a subject outside of the normal curriculum and it has been hugely valuable to experience the challenge of making sustainable changes in the NHS.”

“Overall, I think the sustainability SSC offers a different but very relevant and an important outlook on how healthcare is delivered.”

“I learnt a great deal within this course. I already had an understanding of sustainability but had not applied it to a healthcare setting.”

“The topic was very interesting and a good extra to our course as it is not covered but a vital part of working in the NHS and being a doctor. I believe it is a part of our education that is missing.”

“A doctor has a responsibility as someone who is respected by the community to pioneer changes in practice and influence others to do the same...I think it will change the way I will practise medicine, and will inform many decisions I make in the future.”

For more information please contact:

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## Keele Medical School, UK

### Summary

Following on from a university wide pledge to, “*promote environmental sustainability in all that we do*”, Keele Medical School has been running teaching sessions as part of the core curriculum for all 3<sup>rd</sup> year MBChB students to increase awareness on sustainability within the workplace. These teaching sessions consist of a lecture by a doctor working in the NHS followed by small working groups discussing case studies on waste in the NHS.

The lecture focusses on the doctor’s reflections on his/her clinical practice and how it can conflict with his/her personal beliefs and actions on environmental sustainability. Overall, the students have been very positive about both sessions considering them relevant to their future practice and increasing their knowledge. The students especially enjoyed the style of delivery and the enthusiasm of the facilitators. Many also agreed that these sessions were likely to influence of their future practice. These teaching and learning sessions have since become embedded in the MBChB curriculum.

### Course Description

Keele introduced a whole-cohort introductory lecture during central teaching, delivered by a consultant anaesthetist. The clinician reflected on how his clinical practice often contradicts his personal beliefs in, and personal practice of, environmental sustainability. This didactic lecture-based teaching was followed by breakaway group discussions in which students were facilitated to think further around sustainability in the workplace using four case studies based around prominent types

of waste within the NHS. The groups were facilitated by enthusiastic and knowledgeable staff including the Head of sustainability and energy Officer from the local University Hospitals of North Midlands Trust (UHNM).

*Course or session dates:* This teaching and learning event runs once a year (usually in March) for all 3<sup>rd</sup> year medical students.

*Number of students taught:* 130

*Pedagogical format:* Lecture & Case-based learning and discussion

*Teaching time:* Total student teaching time for this course or session: 2 hours

*Materials used:* Keele educators have developed their own cases based around four prominent types of waste within the NHS: food, pharmaceutical, clinical and fuel. Each case is accompanied by targeted questions to guide students' discussion and help them brainstorm potential solutions and the barriers and opportunities of their implementation. Students are also provided with supporting information for each case based on the published scientific literature, NHS Sustainable Development Unit (SDU) documents and figures, videos, relevant case studies from the SDU and / or Centre for Sustainable Healthcare (CSH) and local initiatives.

Curriculum area: Public health. Development of leadership skills.

### Sustainability learning outcome addressed:

PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems

Existing learning objectives were identified in the Keele curriculum which encompassed the learning objectives for these new sessions on environmental sustainability, hence the listed Keele ILOs were not modified.

### Lessons Learned

Since implementing the first year three intervention Keele has recognised that earlier exposure to sustainability topics would be beneficial to enhance engagement and understanding amongst the medical student cohort. Subsequently, they have introduced the topic of environmental sustainability and healthcare earlier on in the medical course, as part of the introduction to public health lecture. They have also generated a variety of literature review topics for first year medical students to choose from for their SSC. Several students in the subsequent cohort have selected sustainable healthcare-related topics for their SSC from the list, or self-generated.

Based on third year medical students' feedback and the facilitators' own experience, the following points have been identified as being critical for the success of their teaching and learning interventions about environmental sustainability and healthcare:

- ✓ Small yearly cohort size (120-130 students) allows delivery of a whole cohort intervention so that all medical students gain an understanding of environmental sustainability in healthcare
- ✓ Involvement of a mixture of enthusiastic clinical "role models", relevant stakeholders such as local hospital trust sustainable development team and academic staff
- ✓ Use of realistic case-based scenarios for interactive sessions
- ✓ Small group, facilitated discussion
- ✓ The scheduling of the teaching and learning sessions at an appropriate time in the academic year is also important for student engagement.

#### Future plans:

Keele is now looking to build on this early work by providing a variety of environmental sustainability and healthcare-related topics for first year medical students to research and write about (in a 2,000 word literature review) as part of their SSC.

#### For further information, please contact:

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**Botucatu Medical School, UNESP (Universidade Estadual Paulista), Botucatu,  
São Paulo, Brazil**

#### Summary

This forty-five hour optional module for professionals from a variety of health and health-related disciplines formed part of the Public health postgraduate course. The seven-week module brings together postgraduate students from medicine, nutrition, social work, psychology, pharmacy, administration and law.

#### Course details:

This was an optional module, which brought together postgraduate students to learn about sustainability in healthcare. This course has been running since 2012 and there has been increased uptake of the course year on year.

The course consisted of weekly seminars on the following topics:

1. Introduction to environment and health
2. Introduction to chemical toxins and health, including 'Stolen Future' film
3. Theory and practice of environmental health surveillance
4. Genetically modified organisms and their health impacts
5. Health threats from climate change
6. Pesticides and their health impacts
7. Discovery trail and presentations of project designs

Students also took time to study each topic before the session and collected resources in a shared online portal (dropbox). Sessions were interactive, including group discussion and peer-led learning.

*Course dates:* every year from 2012 to present, for example 13<sup>th</sup> March 2017 - 24<sup>th</sup> April 2017

*Pedagogical format:* Lectures, seminars including using materials such as videos to stimulate discussion, peer-led learning, practical outdoor sessions including sustainability walk and green space walk and picnic

Seminars ranged in style from a very interactive session with students sitting in a circle and contributing throughout, to a more didactic session with questions asked of the group to stimulate engagement.

*Teaching time:* 7 x 4 hours = 28 hours of contact time all focused on sustainable healthcare + 17 hours of self-study.

*Number of students taught:* 20 per year on average

*Materials used:*

1. Video, "Futuro roubado" (Our Stolen future), BBC documentary about endocrine disruption caused by man-made chemical contaminants that interfere with hormones in humans and wildlife to stimulate discussion about environmental risks and health
2. A professor from the Toxicology centre of UNESP gave a talk on pesticides and public health

3. A researcher at the Brazilian Association of Biodynamic Agriculture gave a talk on genetic modification and its known and unknown health impacts
4. Local case studies and spaces in Botucatu, such as green hospitals, agroecological food baskets and edible gardens, which were used for the green walk and as discussion topics. The Botanical Garden of UNESP is used as a setting for an environmental trail, reflecting on theoretical content presented in the module. A picnic demonstrates and stimulates reflection on sustainable eating and the students present and share their intervention projects.

## Assessment

The students were assessed on the following:

- Attendance at and participation in seminars
- Group presentations in the fourth week of the programme
- A written report about a practical project that each student should design for their own work place.

## Sustainability learning outcomes addressed:

- PLO 1 - Describe how the environment and human health interact at different levels
  - Reflect on the interactions between the environment and health using an ecosystems framework.
  - Discuss the impacts of climate change on health.
  - Discuss the main problems of Environmental Health, and its interfaces with Public Health, through different approaches and proposals. (LO written specifically for this course)
- PLO 3 – Discuss how the duty of a health professional to protect and promote health is shaped by the dependence of human health on the local and global environment
  - Discuss how environmental health can be used as an instrument to build citizenship, quality of life and sustainable communities. (LO written specifically for this course)
  - Explore the concept and practice of environmental health surveillance in the SUS (Brazil's public health system). (LO written specifically for this course)

## Lessons Learned

- Engagement of students was excellent and the course stimulated deep reflection and ongoing engagement. There was lively discussion during the sessions and a range of perspectives provided by the interdisciplinary group. This highlights the value and depth of engagement and learning that can be achieved in an optional and interdisciplinary course. Students are already reporting implementing changes in their own lifestyles and efforts to implement the intervention project that they designed for their module coursework.

- Student presentations were very effective at stimulating learning. Students were very respectful of each other's work and learnt both through preparing and observing presentations.
- Covering a range of topics with a range of pedagogies and media helped to maintain students' interest.

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## Brighton and Sussex Medical School, UK

### Summary

Brighton and Sussex medical school incorporated sustainability into their core curriculum by giving a one-hour lecture to their 4<sup>th</sup> year medical students during their Primary Care block. The teaching was arranged by a lecturer in public health and was delivered together with a local GP who is the lead for sustainability at the CCG.

### Sustainability learning outcomes addressed:

- PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment

### Experience and Lessons Learned

Educators received positive feedback about the session. That teaching was delivered by a clinician gave the students a "hook" that engaged them and made the teaching relevant to their practice. Meeting with the module leader in the preparation phase for this session ensured that the teaching on sustainability was in line with the rest of the teaching on the primary care module. Ensuring that the content had examples of local practice in primary care helped to link this lecture to the rest of the module and to the students' future roles.

One problem highlighted by the educators was that the lecture was given at the end of year 4 therefore introducing the "language of sustainability" too late for many students; it might have better results if incorporated earlier on in students' medical education. A further concern was that a stand

alone lecture such as this in the primary care unit may imply to some students that sustainability is only relevant to primary and not secondary care.

Reflecting on the teaching, the organiser felt that it would have been better managed in small groups and in seminars rather than large groups – however BSMS had a limited capacity of teaching staff with the appropriate expertise at the time of the teaching.

*Lecture date:* 17/06/2016

*Pedagogical format:* Lecture

*Number of students taught:* 140

*Teaching time:* 1 hour

*Curriculum area:* Primary Care

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## Dundee Medical School, UK

### Summary:

Dundee included sustainability as an option for their Student Selected Component (SSC) modules throughout the medical school year-groups and included some lectures on sustainability in their core lectures.

### Course and lecture details:

First-year students received two lectures that were specifically focussed on sustainability. The first was an introductory lecture on “How to live forever” aiming to show the bigger picture of healthcare. It included information on climate change and the environment, as well as slides from Hans Roslin’s work on life expectancy. The second, later on in the year, was integrated into respiratory lectures with an hour being dedicated to learning about the environmental causes of lung disease (in 2016, the lecture was expanded to include health impacts of water pollution also).

First year students were also able to choose “Sustainable Healthcare” as an SSC topic. This involved 40 hours of project-based work for 5 students in a student-led module. The students and the tutor initially met for a chat about the overall learning objectives and the students subsequently submitted essay titles and brief abstracts for their proposed essays. Essay outlines were submitted half-way through the SSC (limited to an A4 sheet of paper) and then at the end of the four-week period submission of a 10 page essay was required.

A lesson learnt from student feedback is that students may have preferred a more structured start to the module, such as a seminar to introduce the topics. The tutor plans to replace the informal discussion based on pre-reading with a short seminar and discussion group to explore ideas for projects, which is slightly different from most SSC modules in Dundee which are usually entirely student-led.

A four-week SSC on sustainability is also planned for second and third year students. Fifteen students will be given the option to attend seminars followed by project-based work on sustainable healthcare. This SSC will be enhanced by combining seminars with other SSCs that run simultaneously, therefore getting a broad mix of engagement from students throughout the medical school.

*Pedagogical format:* Seminar, lectures and project work

*Assessment:* Assessment of the SSCs was completed by educators who marked the students’ written submissions and / or presentation of their project work

#### Sustainability learning outcomes addressed:

- PLO 1 - Describe how the environment and human health interact at different levels
- PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment

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## Georgetown University School of Medicine, USA

### Summary

“Introduction to sustainable health” is a 1.5 hour interactive workshop now scheduled for its second year in the Patients, populations, policy (P3) module. The workshop is a required experience for all first-year medical students (~200) and begins with a definition of environmental health, followed by an introduction to the overall causes, mechanisms and impacts of climate change.

### Background

The faculty member who developed this session looked at the courses run by her department and identified those most amenable to climate-change topic related insertions. Because she has a relationship with her departmental colleagues, she was allowed to include these topics without adding substantially to the curriculum. Specific sustainability learning objectives were added to the P3 workshop, linked to the overall teaching goals of the course.

### Course Description

The session addresses the following questions:

1. What are the mechanisms and impacts of climate change?
2. What are some of the barriers to implementing sustainable behavioral and institutional practices?
3. What are some commonly identified strategies to reduce greenhouse gas emissions?
4. What actions can doctors take to improve sustainability?
5. What effects does climate change have on air quality and by what mechanisms do increased temperatures affect air quality?
6. List common air pollutants. By what mechanism do they harm health?
7. What are the health effects/outcomes of air pollution?
8. Which populations are the most vulnerable and what environmental conditions increase individual vulnerability? How might lower SES influence exposure or susceptibility to air pollution?
9. What is the air quality in dc today and what does it mean? What advice would you give your 16-year-old asthma patient if the air quality index is 130? What are your options in counseling your vulnerable patients? How useful are face masks?

After listening to an introductory summary outlining the mechanisms and impacts of climate change, students identify their degree of concern about climate change through clicker voting, which is then compared to US percentages (‘6 Americas’) and their political affiliations, and discuss barriers to addressing climate change in their personal and professional lives.

Students also calculate their carbon footprint. They then are given a case study which links air pollution and climate change. The students form small groups to answer questions such as how to look up air quality, how to address the impact of air pollution on respiratory disease, what travel

advisories would they give restricting travel to areas with high levels of pollution, and how to use an app to detect wildfires.

*Year group taught: 1<sup>st</sup> years*

*Status of this teaching within the curriculum: Core*

*Curriculum area: P3 is an existing introductory course aimed at familiarising students with the US health care system (and comparing it with other systems), financial structures and health care coverage, and addressing issues important to population health, including a focus on social determinants of health.*

*Pedagogical format: lectures interspersed with interactive learning activities*

*Teaching time: 1.5 hours*

*Number of students taught: 200*

*Materials used: PowerPoint slides; background articles*

Session dates: Takes place in October, has so far run in 2017 and will run in Fall, 2018

#### Sustainability learning outcomes addressed:

- PLO 1 - Describe how the environment and human health interact at different levels (“Explain the causal relationship between climate change & health”)
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment (“Identify personal, professional and global solutions to atmospheric carbonization”)
- Other: Advise patients on monitoring air quality to minimize respiratory and cardiovascular effects of air pollution

#### Lessons Learned

- Based on reactions from students, the session lead found that to enhance effectiveness of the teaching, there needs to be more emphasis on solutions and more follow-up to support the learning. In the next iterations there will therefore be more focus on solutions available to students, and opportunities for follow-up will be provided e.g. research projects, service projects or support for advocacy.
- The educator recommends forming alliances with faculty in other departments and working with them to take a similar approach, consistent with previous recommendations on an integrated climate change curriculum.

An educator (small-group leader) new to teaching the course said:

“Yesterday's content on PCMH and community-focused/patient-centered care, using asthma as the example but then expanding the view by bringing in climate change and environmental impact on individual and community health is just plain genius. Over the course of the morning, the learning was just at optimal level. This session is a beautifully-designed flow and weave of content and teaching method.”

For further information or to receive a copy of the workshop slides, please contact:

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## Kings College London Medical School, UK

### Summary

Kings College London (KCL) has taken a novel approach to including sustainability in their curriculum, and has developed Quality Improvement Projects (QIPs) for 4<sup>th</sup> year medical students. This approach has been steadily growing since 2015 with each year seeing more students engaging in sustainability-focussed QIPs, and all students (even those whose focus is not on a sustainability QIP) now evaluate the sustainability aspects and implications of their QIP. The majority of sustainability QIPs are in General Practice (GP), but students carrying out QIPs in hospitals can also choose a sustainability focus.

### Course Description

In 2015/16, six selected GP practices and 18 allocated students were involved in the KCL pilot project. Students undertook a modified Health Promotion review, which involved collecting baseline quantitative data to inform a Plan-Do-Study-Act (PDSA) cycle as part of a QIP.

GPs were offered written information and one face-to-face briefing session about sustainability and quality improvement in 2015/16. The GP practices specified the focus of the QIPs. In 2018/19 the pre-project clinical educator training is being adapted to make it more accessible to GPs, and will comprise e-learning and a webinar.

The pilot project benefitted students and GP practices alike. Students gained research experience and learnt more about sustainability in the workplace. Clinical educators also learnt about sustainability, and many cited improvements in sustainability in their workplace. The project was therefore expanded in 2016/17 and 2017/18 so that all fourth year students (not only those allocated to certain GP practices) now have to report on the sustainability aspects of a QIP carried out in a group of five in either a hospital or a GP setting.

Examples of projects completed by students are facilitation of a move from paper to electronic prescribing in a GP practice, and establishment of diabetic support groups which has stimulated members to change their dietary habits and physical activity. The electronic prescribing had been available to GPs, but not achieved sufficient uptake until the student project evaluated and acted to support uptake. The diabetic support groups instigated by the students remain active, welcoming new members, and were re-audited by the 2017-18 student cohort.

*Course or session dates:* 11/12/2015 until 29/04/2016, and in subsequent years

*Number of students taught:* 18 in 2015-16, expanding to 430 in 2017/18

*Pedagogical format:* Project Based

*Teaching time:* 8 hours. Self-directed learning: 6-12 hours

Teaching time for sustainable healthcare (hours): 2-3 hours

*Curriculum area:* General Practice

#### Sustainability learning outcomes addressed:

- PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment

#### Lessons learnt

- Educators at KCL reflected that this type of project needs significant pre-project briefing to ensure that both students and staff understand sustainability concepts and are prepared to design and run a QIP. The attendance of GPs at a face-to-face briefing was low, hence the decision to move to e-learning and a webinar. Educators also emphasised that it is important that all the GPs in the practices are on board to support the project's success.
- Overall, students valued and embraced the project. Since the project is time intensive, informing students early on about their allocation and giving them time to get to grips with the pre-reading and e-learning early is very beneficial.

#### A GP said:

“Enthusiastically engaged with whole practice team to implement the change to electronic prescribing with a realistic target and using a variety of ideas to educate and encourage change in both staff and patients without causing significant extra work for staff and educating patients positively to encourage compliance with good effect.”

### Students said (focus group):

“I’d never really thought about this kind of thing before, so it was good to see how these projects work from a smaller scale just so that it was something that we could do in a short space of time, but as [I] said, just quite useful to understand ‘cos it would be quite useful in our future practice if we wanted to improve certain aspects of it.”

“...overall I thought it... the practice was great in terms of letting us do what we needed to do, the project itself I think is a good idea, just with the issues we had and I think the timeframe it could be improved, with how it’s implemented.”

“...maybe sometimes it’s hard to link sustainability with the quality improvement project you’re trying to do, like ‘cos for us sustainability wasn’t a focus in terms of trying to implement, or design our project, and I mean it could have been a bit more I guess, but they’re two different things to think about at the same time I guess.”

“I think for me it highlighted that this is kind of going to be the new, not craze, but the new focus for the NHS to be more environmentally friendly and green.”

### For further information, please contact:

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## Southampton Medical School, UK

### Summary

Southampton offered a student selected unit (SSU) for 4 students in year 3. The unit covered sustainability within the NHS and climate change in a global context. The course took place over 2 and a half months and was varied in pedagogical formats using lectures, seminars, group projects and field trips to local areas of interest. The students that took part in this SSU stated that the course broadened their horizons and that they really enjoyed escaping the norm of sanitised medical education where answers are right or wrong.

### Course description:

The first session covered the science of global warming, taking the students back to chemistry and physics that they may have come across in school. Other sessions, run by a variety of facilitators and lecturers, covered a huge range of topics:

- The potential health impacts of rising temperatures – Prof S. Padmadas, Professor of Demography and Global Health, University of Southampton
- Waste management at University Hospital Southampton (UHS) - Mr Andrew Hatcher, Head of waste management, UHS
- Sustainable transport at UHS - Mr Rui Marcelino, Sustainable Transport Manager, UHS
- What should we leave our grandchildren – Dr Robin Stott, Climate and Health Council
- Energy consumption and management - Mr Mark Bagnall, Head of estates, UHS
- Demographic and population changes resulting from rising sea levels in low lying and delta regions in the world – Prof S. Padmadas, Professor of Demography and Global Health, University of Southampton

There were two field trips, where students visited:

- University Hospital of Southampton's Combined Heat and Power Plant
- Ordnance Survey headquarters in Southampton to see an environmentally sustainable building design, including ground-source heat pump.

The practical application of sustainability was woven through the course, the final session quantifying the CO<sub>2</sub> emissions for a DC cardioversion, bringing together resource use and energy consumption. The students presented their own project work during the final session which included topics such as:

- Edible cutlery
- The carbon intensity of beef rearing
- The impact of rising sea levels in Southampton on healthcare delivery

The students went on to present their findings on DC cardioversion at the Sustainability Symposium in Brighton on 22nd June.

### Lessons Learned

Educators leading this SSU have reflected that the initial lesson on the science of climate change would benefit from the production of a glossary of terms before the session.

Feedback on the sustainability teaching evidenced a positive experience for staff and students alike. Students' feedback stated that they were never bored and that the variety of subjects covered was broad but not exhaustive. Student engagement in the project to carbon footprint the DC cardioversion pathway was particularly well received, suggesting that practical projects that enable students to apply their learning can stimulate engagement.

*Course or session dates:* 15/01/2016 until 01/04/2016

*Number of students taught:* 4

*Pedagogical format:* Lectures, Seminars and Project-based

*Teaching time:* 30 hours

*Curriculum area:* Public Health

Sustainability learning outcomes addressed:

- PLO 1 - Describe how the environment and human health interact at different levels
- PLO 2 - Demonstrate the knowledge and skills needed to improve the environmental sustainability of health systems
- PLO 3 - Discuss how the duty of a doctor to protect and promote health is shaped by the dependence of human health on the local and global environment

For further information, please contact:

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## Abbreviations

KCL – Kings College London

QIP – Quality Improvement Project

SHE network - Sustainable healthcare education network

UHS - University Hospital Southampton

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## Report Authors

### The Centre for Sustainable Healthcare

The Centre for Sustainable Healthcare (CSH) is based in Oxford, UK; it seeks to support healthcare transformation for a sustainable future. The Sustainable Healthcare Education (SHE) Network runs under the umbrella of the CSH as its education arm. It is a dynamic group of clinicians, academics, medical educators and students who believe that sustainable healthcare education should feature in all health professional training, and are working to make this a reality.

CSH website: <https://sustainablehealthcare.org.uk>

SHE Network: <https://networks.sustainablehealthcare.org.uk/sustainable-healthcare-education>

### Healthy Planet UK

The student group Healthy Planet UK, who work in partnership with the SHE Network, seek to engage in the issues that surround climate, health and sustainability through a combination of learning, teaching, action and advocacy. Healthy Planet members believe that, in order to protect the health of vulnerable groups now and of future generations, medical students need to ask more of older generations and to act themselves in mitigating and adapting to climate change – starting with healthcare sustainability.