



CLIMATE CHANGE AND THE DETERMINANTS OF HEALTH IN MEDICAL SCHOOLS

CASE STUDIES v1.1

Eight medical schools in England have joined the National Network of Public Health Educators at Medical Schools (PHEMS) “Climate change and the Determinants of Health in Medical Schools” Project in 2009-10. The aim of the project is to pilot effective educational approaches to help students understand the links between health and climate change, and to share outcomes.

The case studies below outline the experiences to date of the pilot medical schools, to January 2010.

CASE STUDY - Bristol University

Dr Trevor Thompson has been running a “Global Environment and Human Health” student-selected component for Year 2 students since 2006. The course is unlike anything previously taught at the medical school and appeared to Dr Thompson as “an obvious gap in the curriculum”. Although he was initially motivated by a personal interest in the subject, over the past four years he has been encouraged by the large number of students choosing to join the course.

The eight-week module invites expert presenters to introduce topics including: the science of climate change; water scarcity; sustainable food; greening of the NHS; peak oil; and behaviour change. A key feature each year is the direct action project – for the last two years this has been to organise a farmers’ market in the university.



Students at the Farmers Market organised through the course in 2008. The market has since become a fortnightly event on campus.

Important contributors have been Dr Chris Johnson, medical doctor, author and addictions specialist, who helped in the first iterations of the course, and guest lecturer Professor Paul Valdes from Bristol University – climate scientist and IPCC author.

Course learning outcomes:

- 1) To raise awareness of global environmental changes resulting from human activity
- 2) To investigate the links between human health and this changing environmental context
- 3) To discover creative ways in which medics can respond to this global challenge

These are evaluated by means of a written topic review, which is also presented orally to the group, and a book review.

“At the start of the course I was very sceptical about how relevant GEHH would be to medicine but each week I was more and more convinced that it is in fact highly relevant to many areas of medicine, and increasingly so. I think for me it was scientific facts which helped persuade me to accept just how relevant climate change is to health.”



Y2 student

In addition to the Year 2 student-selected module, intercalating students doing a BSc in International Health have a seminar on climate change and water, led by Dr Ian Baker, and Dr Thompson is now covering global environment and human health in two core lectures, in Years 1 and 3. A vertical theme on international health is also under development, to run across the whole curriculum, looking at health inequality and determinants of health.

In the Year 1 lecture, which falls in the “Human Basis of Medicine” unit of the curriculum, students are introduced to systems theory, examining questions such as “what happens when feedback loops are not responded to?” Examples of small, medium and big systems are explored (from human physiology to the entire biosphere as a self-regulating system) and the global determinants of human health are considered. Learning is evaluated through a question in the first year exam.

The Year 3 lecture is entitled “Environmental Challenges to Global Health” and covers topics including “how will we run the NHS on 40% less energy?”

Learning materials: Dr. Thompson has offered to share the following slide sets, developed specifically for this teaching:

- “Earth Consultation” – medical consultation of the Earth, symptoms
- Peak Oil (includes embedded audio quotes)
- Environmental Challenges to Global Health

Other key materials used include “General Systems Theory” by Ludwig von Bertalanffy.

“I strongly recommend getting the scientists involved to interpret academic papers. Also, the experience of direct action, such as setting up the farmers market, as part of the course: next year we are planning a visit to a pharmaceutical company or a nuclear power station. It is great to get students thinking and generating ideas – using the World Café format and contact with the Transition Town movement has been helpful in this.”

Dr Trevor Thompson, course lead

“Without wanting to sound too cheesy, I have found this course empowering. As medical students I find that often we are encouraged to think and understand things in a very ‘black and white’, ‘boxed in’ way. This course has helped me to think out of the box again, see other options for healthcare and look at the bigger, global picture of health. I hope that I have the opportunity to do more units like this in the future.”

Y2 student

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CASE STUDY - Imperial College London

All students at Imperial undertake an intercalated BSc in their fourth year, choosing from thirteen possible topics. Students choosing Global Health have a one-week module on climate change as part of the course. Teaching is given as lectures in the morning, student-led seminars in the afternoon, with occasional videos or guest presentations. In addition, students may choose climate change as a topic for their research project for the final ten weeks of the year.



Generic learning outcomes for the BSc are applied to the climate change module such that, by the end of the course, students should be able to:

- Discuss key issues in public health on a global scale
- Describe and interpret key study design and epidemiological methodologies in relation to global international health
- Be aware of and able to search various data resources for data on international health problems
- Be able to conduct systematic reviews
- Understand and appreciate the role of novel genetic and molecular methodologies in researching public health
- Understand infectious disease epidemiology and the population control of extant, re-emerging and emerging infectious diseases (also in relation to climate change)
- Discuss the main causes of ill health in the developing world
- Identify the key players in international public health
- Appreciate the need for a multidisciplinary approach, spanning biology, socio-cultural approaches, economics and politics, for understanding and researching global health
- Plan and carry out supervised research resulting in a short dissertation

Materials used include introductory books on climate change, readings discussed in the seminars and videos (from Channel 4 and other freely available videos from the web).

In-course assessment is based on contribution to seminars and final assessment is based on the written project.

Although the compulsory BSc has just started, it is the expansion of a previous elective BSc. In general there has been great enthusiasm of students around global health issues, including climate change. Imperial is now also launching an MSc in Global Health, and is looking to expand relationships with the Institute of Global Health and other London institutions. In future they plan to put greater emphasis in the course on mitigation, adaptation and inter-disciplinary work.

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east of england teaching public health network



THE CAMPAIGN FOR
GREENER HEALTHCARE

NHS
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CASE STUDY - Kings College London

For KCL medical students, traditional teaching on health promotion has taken on a global flavour. The personal commitment to the subject and enthusiasm of theme lead, Dr Ann Wylie (voted “best teacher” in the medical school this year), has been matched by that of the students themselves: KCL has an active branch of Medsin, and hosted their Global Health Education Project conference in 2009.



Medsin UK's Global Health Education Conference held at KCL, October 2009

Climate change has been made a cross-cutting theme for a new “Global Health Day” planned for February 2010. The day forms part of the core curriculum for Y4 students and features six workshops:

- access to medicine – led by Dr Rona MacDonald (The Lancet) & Medsin students
- inequalities & health – led by Dr Roberto DeVogli & Dr Ann Wylie
- migration (of health workers) & health – Dr Andy Leather and panel discussion
- actors & agents (who’s who in global health) – led Dr Alex van Tulleken & Medsin students
- careers in global health – Alma Mata
- environment & health – led by Dr David Pencheon (NHS Sustainable Development Unit)

In addition, there will be a keynote lecture on the UK Government’s Global Health Strategy.

The aims of the Global Health Day are to raise awareness about complexities in global health, and to help students consider their role on global health issues (both on their elective placements and as future physicians). All presenters have been asked to consider climate change in their contributions.

Evaluation will take place through an online survey taken soon after the day and again on students’ return from electives in October 2010, and via a 1000 word essay in their elective planning portfolio.

Climate change is also touched upon in Dr Wylie’s Year 3 lecture on the global health burden of tobacco, which includes the environmental burdens of deforestation and soil degradation from tobacco farming.

“I’ve used the hard won health promotion slots already in curriculum, sought additional opportunities and blended teaching to make it more global and relevant” says Dr Wylie.

KCL is establishing a new centre where global health SSCs, BScs and core teaching will be based. These SSCs include discussion on the importance of climate change to health, and the BSc will include more detailed analysis of the topic. Medsin-KCL has recently launched a Healthy Planet group, run by medical students Georgina Gosley and Vita Sinclair, which is working to create specific Climate Change & Health SSCs (to be launched in September 2010) as well as to review the medical school core curriculum for opportunities to include climate change. Medsin-KCL is also working to involve the Geography Department in global health, so that students from medicine, geography and other schools can study these issues together, taught by staff from a variety of faculties.



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"It is imperative that we consider how climate change is influencing healthcare, both in the new challenges it will present and the adaptations we must make to prevent and respond to it. This is especially true for those students who will one day have a professional duty of care over the health of others. Only by educating ourselves on this issue now can we hope to negate the impact climate change will have on health in the years to come."

Georgina Gosley & Vita Sinclair – KCL Healthy Planet Group

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CASE STUDY - University of Cambridge

Cambridge medical students have been learning about climate change and health through a new final year seminar organised by Dr Steve Gillam. Dr Gillam decided to set up the session out of his own concern for the issue, and through partnership with Dr David Pencheon and Dr Fiona Head at the NHS Sustainable Development Unit, which is sited nearby.



Learning outcomes for the seminar:

- To describe the effects of climate change on health and health inequalities.
- To examine the NHS' carbon footprint.
- To define the relationship between adaptation and mitigation and the health co-benefits of each.
- To discuss the role of doctors/medical students in addressing climate change.

(The medical school curriculum has not been altered as these outcomes relate to pre-existing learning objectives for determinants of health.)

The information is presented using slides developed with Dr Pencheon and Dr Head from the SDU (slides are available in part to share with others). To date, the session is not formally assessed.

Barriers encountered include lack of available curricular time, variable levels of pre-existing knowledge among students, scepticism among a minority, and a shortage of faculty confident to teach in this area – but the scene is evolving quickly. Students are getting better at recognising wider determinants of health, the hurdle for some remains in seeing the relevance to acute clinical practice. For those who do want to take action, it is important to teach them about health care structures so that they can see where to start.

“This is a 40 minute seminar in a week of lectures that range from acute medicine to public health. It is often hard to get the students to change gear (e.g. from acute MI management to sustainability) this is a challenge in teaching!! Exploring ethical implications was important - many of my conversations ended up with ethics this year.”

Dr Fiona Head

“Teaching the science is less important than raising debate about our role - as doctors or good citizens – in addressing climate change.”

Dr Steve Gillam

In addition to the final year seminar, students in their first clinical year have the opportunity to learn about climate change as part of a student selected component on International Health.

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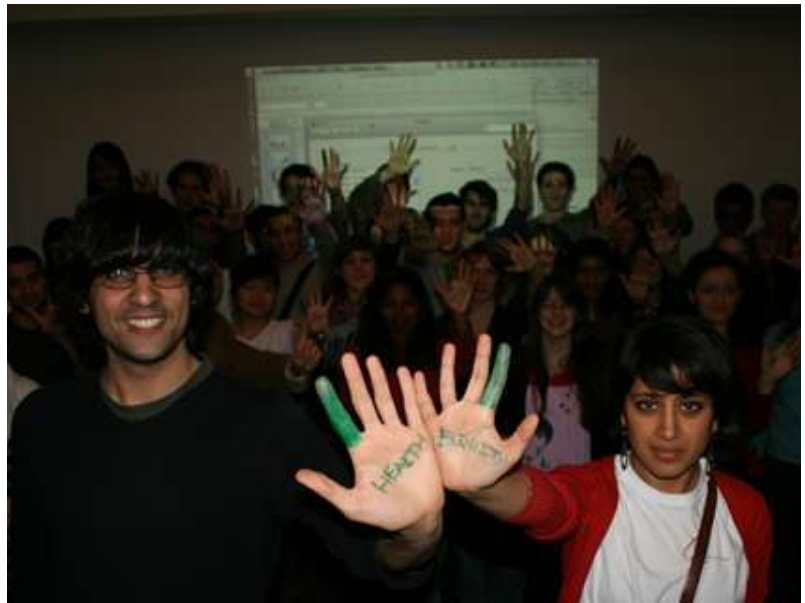
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CASE STUDY – University College London Medical School

First year clinical student, Mustafa Abbas, is a passionate advocate of climate change and global health in medical education, and is just as passionate about active participation of students in their own learning.

Following an intercalated BSc in International Health last year, Mustafa has followed his convictions to develop a student-led course on climate change and health for Year 2 medical students at UCL. The course is to be offered in 2010-11 as a student selected module (SSM), taught through eight half-day sessions across two terms.



UCL students, Mustafa Abbas and Davina Kaur Patel at the student-organised "Healthy People, Healthy Planet" conference February 2009

The eight sessions will cover:

1. The Physical Sciences of Climate Change and Basic Global Health
2. Advanced Global Health and Climate Change
3. The Health Co-Benefits of Action on Climate Change
4. Climate Change Economics
5. Climate Change Mitigation Policy
6. Climate Change, the NHS, the Health Profession, and You
7. Assessment Discussion: recap of previous sessions so far, followed by group discussions ("ideas cafe")
8. Self Directed Study or Flexibility Session

The climate change SSM makes use of students both to organise and deliver teaching. External speakers are invited to contribute to some sessions but, at the very least, students input into the session outline.

Course learning objectives:

1. To understand the climate system and understand climate change as an abnormal, acute change in the climate system
2. To be able to explain the basic and advanced processes by which climate change will affect global health
3. To be able to explain the potential public health improvements in developed countries gained by carbon emissions reduction policies
4. To understand to a basic level the economics and policies of equitable climate change mitigation



5. To relate climate change health, economics and policies to the NHS and the role of the health professional, doctor, and student, in tackling climate change

Teaching materials are being developed based on information from major sources: WHO, IPCC, The Lancet, UNEP. Evaluation will be 50% from attendance and participation, and 50% from a 2,000 word introductory summary of a topic area of interest. The intention is that topic summaries will then be used for the basis of an E-learning module on climate and health, alongside audio-recordings and slides from the teaching sessions.

The course outline is available to share on request.

“The real gem of the UCL SSM is that it is student-run and student-led. Students must be empowered by academics and staff to become active participants in public health and social medicine education. If we are limited to being passive recipients in the education process then we severely limit the programmes themselves. Through years of Medsin conferences, workshops and seminars, we have learnt that the very best sessions are student-led. Making your project student-orientated is not just beneficial for the professional development of your student-leaders, it is also crucial for the deeper success of the project itself.”

Mustafa Abbas

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CASE STUDY – St George’s, University of London

In 2009, Dr Hugh Thomas took up the post of theme lead for public health and population medicine. His return to public health after ten years as a practising GP was motivated by a desire to engage the medical profession on the determinants of health and global issues, including climate change.

Final year medical students at St George’s rotate through a compulsory two-week public health teaching block. This year Dr Thomas, with colleague Dr Sunil Shah, has introduced a new element: the showing of a climate change film.

'Age of Stupid' is a 90-minute film about climate change, set in the future, but looking back at 'archive' footage from 2007 to ask "why didn't we stop climate change when we had the chance?"



Pete Postlethwaite in 'Age of Stupid'

On the course, the film is introduced by Dr Thomas with the observation that the presidents of three medical Royal Colleges - physicians, child health and public health – consider climate change to be the most important public health challenge facing the world. A short discussion follows the screening, accompanied by a simple one-sheet handout outlining the 10:10 climate change campaign action points.

Feedback from students indicates that the session is generally well-received, with 57 students (52%) rating the film as excellent (5/5) and 7 students (6%) rating it as poor (1-2/5).

"A bit much emphasis on climate change. An important topic but not necessarily the most appropriate topic on this course."

"It was nice to spend some time looking at global warming (age of stupid) as this seems to be vastly important!"

"Be nice to follow up 'The age of stupid' with more specific/relevant explanation of the impact of global warming."

Year 5 students – course feedback

Materials: the Age of Stupid is available free-of-charge to the NHS, for showings to staff and students: www.greenerhealthcare.org/age-of-stupid. The 10:10 Take Action Checklist can be found at www.greenerhealthcare.org/1010-take-action-checklist.

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CASE STUDY: School of Medicine Health Policy & Practice, UEA, Norwich

The University of East Anglia is well known for its research in environmental sciences and international development studies. Public health tutors, Stefi Barna and Veena Rodrigues, recognised the links between climate change, sustainability and the Healthy Universities programme, and decided that these should be reflected in the medical course at UEA.

As well as tapping into the expertise on campus, and at the new NHS Sustainable Development Unit nearby, they were keen to link up with other medical schools teaching these issues. They took the opportunity to set climate change as a theme for the annual meeting of the National Network of Public Health Educators at Medical Schools (PHEMS) in June 2009, which provided a useful exchange of ideas and resources.



Public health educators plan climate change teaching at the PHEMS network meeting in June 2009

From academic year 2009-10, UEA medical students now encounter climate change and determinants of health on at least three occasions in the course: a dedicated Year 1 seminar, a choice of related topics in Years 1 & 2 student selected studies, and a global health lecture in Year 4.

“The Schools of Environmental Science and International Development at UEA are at the forefront of research into climate change and its effects on developing countries. It is essential that medical students should learn about the likely impacts on global health and consider how these can be mitigated.”

Professor Sam Leinster, Dean

Public Health learning outcomes for the MBBS course were altered to embed learning outcomes on climate change and determinants of health, during the annual curriculum review by Public Health theme lead (Dr Rodrigues).

Core learning outcomes:

A. Year 1 (seminar):

1. Discuss the wider determinants of health (Dahlgren & Whitehead) and the potential interaction between these.
2. Discuss the environmental hazards to health including the health effects of climate change.
3. Outline measures to mitigate the effects of environmental hazards to health.

B. Year 4 (lecture):

1. Discuss from a global perspective the determinants of health and disease.
2. Describe global variations in healthcare delivery and medical practice.

Evaluation takes place through short answer questions within the end of year written exams.



Optional learning outcomes (Years 1 & 2 Student-Selected Study - SSS):

1. Explain how climate change is projected to impact health inequalities either in the UK or internationally
2. Are doctors responsible for the carbon footprint of their patients? Explain the rationale and controversies for sustainable development plans in the NHS.
3. How convincing is the evidence that the obesity epidemic can be solved by a nationwide "active travel" policy?
4. Explain the relationship between the built environment (man-made surroundings) and one common chronic disease of your choice.
5. How strong is the evidence for the "co-benefits" to cardiovascular health and the environment of a low carbon economy?
6. What are the likely effects of climate change on respiratory health and how could they be mitigated?

SSS presentations are delivered and assessed at the end of each module over the two years.

Learning materials are compiled largely from existing resources and are available to share on request.

"It is important to highlight the links between clinical practice / clinical outcomes and this topic to demonstrate its relevance to future doctors"

Dr Veena Rodrigues

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CASE STUDY - Peninsula Medical School

At PMS, all Year 2 students now learn about global health determinants in two Child Health workshops, developed by Dr Margaret Somerville and Dr K Kumaran in 2008-9. In the first workshop, country vignettes from the WHO statistics database are used as a basis for student discussion – looking at the causes of child mortality, the contribution of wider determinants and the relationship between spending on healthcare and life expectancy.



The second 90-minute lecture/workshop examines further the global economic and political influences on health. The students work in groups to consider what we can do to reduce the burden of disease as individuals, in small communities, at country level and internationally. This is followed by a slide presentation, covering: international frameworks, the effects of poverty, the WHO Commission on Social Determinants of Health and the Millennium Development Goals. Using information from the Intergovernmental Panel on Climate Change (IPCC) on the Mekong Delta and on agriculture in Egypt, the session explores the health consequences of climate change impacts on land use, water and migration. (Slides available to share on request)

The question “How do the Millennium Development Goals relate to you in real life?” is used as the basis for an ethical discussion.

The Year 2 core curriculum was adapted to include the following learning outcomes:

- Increased awareness of global political and economic influences on health
- Recognise the influence of social determinants on health
- Understand the impact of climate change on health
- Consider the role of doctors in relation to these issues

These learning outcomes are not currently assessed.

In addition to the Year 2 teaching above, climate change has been discussed as a possible topic for Year 1 students undertaking their formative SSU, and may be offered in the future. Further teaching on global issues will be considered in future curriculum reviews.

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