

bar – the greenhouse gas-containing bar, responsible for climate change.

The result is, effectively, reversal of the process that supports life as we know it – planetary suicide. The planet cannot recycle all that carbon, and if we don't reverse it, will become uninhabitable by humans.

The only lasting solution: Keep fossil fuels in the earth, where nature has put them

Ecuador has large oil reserves in one of the most biodiverse regions of the world. Some years ago social movements and civil society organisations who wanted to protect the biodiversity and indigenous lifestyles began a campaign for a world emancipated from the need to burn fossil fuels – a post-oil civilisation. The campaign is supported by the Ecuadorian government, and by campaigning groups in a growing number of countries. Germany has pledged financial support. The campaign slogan is: *Keep the oil in the soil, keep the coal in the hole, and keep tar sand in the land.*

Although it originated in Ecuador around local issues, the campaign has worldwide implications. If we look at the carbon cycle and its implications, it is clear that its

simple, yet radical, slogan points to the only effective and lasting way to combat global climate change.

How well are we teaching health science students about climate change and health?

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Climate change and the issues of sustainable development are a new component of the health sciences curriculum. While the topic is now included in basic education the relevance to healthcare providers, health systems and the healthcare industry needs to be incorporated within higher education institutions.

Health sciences faculties are themselves part of the problem. For example, the Faculty of Health Sciences at Stellenbosch University used 16.4 million kWh in 2010, making it a

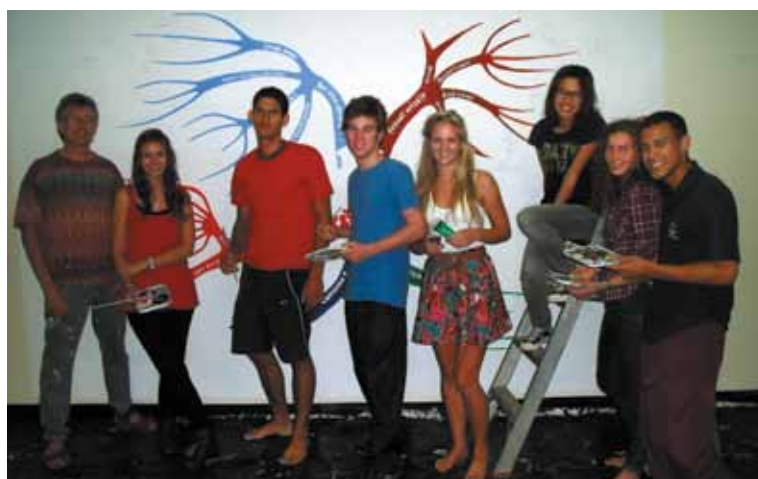


Fig. 1. Students and author paint a mural on climate change.

Table 1. Consensus on the medical school curriculum for climate change

Learning objectives

We propose nine learning objectives, of which four are core objectives to be used by all educators, regardless of the teaching format. Learning objectives are based on the WHO Health and Climate Change module.

Core objectives (with optional sub-topics)

1. Climate change as an environmental hazard: explain how climate change impacts on health inequalities and the wider determinants of health

- a) Outline the effects of climate change on health:
 - Mechanisms by which climate change affects the wider determinants of health
 - Disease processes affected by climate change
 - Examples of health effects that have already been observed
 - Examples of projected health effects
- b) Describe the impact of climate change on health inequalities:
 - The exacerbation of inequalities through the impact of climate change
 - The role of inequalities in causing climate change
 - The theory of contraction and convergence
- c) Discuss ethical issues over distributive justice in carbon reduction

2. Define the relationship between adaptation and mitigation and the health co-benefits of each

- a) Define mitigation and adaptation
- b) Give an example of an adaptation measure which runs counter to mitigation strategies
- c) Give an example where adaptation and mitigation strategies are synergistic
- d) Health co-benefits relating to policies on:
 - Redistribution of resources (e.g. carbon allowances)
 - Transport, food production, energy generation, home energy efficiency
 - Population control

Table 1. Consensus on the medical school curriculum for climate change (Continued)

3. Demonstrate clinical, leadership and management skills for low carbon healthcare

- a) Describe how sustainable lifestyle interventions (e.g. promoting active travel, dietary change, home energy efficiency, sustainable occupations) can be used to prevent common diseases.
- b) Describe ways in which patients may be supported to care for themselves (e.g. through patient information & training, provision of direct access to health data, supporting uptake of home therapies, use of shared decision-making techniques, development of patient-centred care plans, provision for flexible/patient-initiated access to care)
- c) Demonstrate effective conduct of a telephone consultation with a patient
- d) Understand the principles and methods of service improvement with respect to sustainability, efficiency and patient experience. Describe how to obtain feedback from staff and patients, analyse processes, identify improvements and plan how these could be implemented and evaluated
- e) Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the environmental impact of care, and the use and prioritisation of resources

4. Demonstrate advocacy skills for action on climate change and the determinants of health

- a) Demonstrate understanding of the wider implications of the duty of a doctor to 'protect and promote the health of patients and the public': give three ways in which doctors may influence the determinants of health for their patients
- b) Explain how behaviour change models apply to promoting healthy, sustainable lifestyles
- c) Informal advocacy: discuss with colleagues whether or why individuals in the health system should act on climate change, e.g.:
 - Importance of a healthy global and local environment to the health of patients
 - The potential benefits of sustainable care to patient experience
 - Health economics: increased productivity with fixed resources
 - Compliance with carbon reduction legislation and targets
 - Leadership in local communities
- d) Formal advocacy: give a 15-minute presentation or write a letter to senior colleagues on what the health system can do to mitigate against climate change, covering, e.g.
 - Carbon reduction strategy
 - Trust level involvement: monitoring, reporting and reviewing carbon
 - Clinician engagement (prevention, self-care, lean pathways, low carbon treatment choices)
 - Partnerships with local councils and community organisations
 - Advocacy and awareness raising
- e) Describe strategies for creating a support network to increase the effectiveness of professional actions
- f) Discuss the potential conflicts of interest presented by a transition to sustainable healthcare (e.g. challenge to dominance of bio-medical models in healthcare, patient expectations, commercial interests)

Additional (optional) objectives

5. Explain the basic scientific evidence base for global warming and climate change. Make reference to systems theory and importance of feedback loops (normative and amplificatory) in auto-regulation of climate and global biological systems
6. Critically appraise scientific evidence linking climate change and health
7. Access information sources on climate change, health and mitigation measures and use the information in relation to patient care, health promotion, giving advice and information to patients and research and education
8. Explain the concept of 'carbon footprint' of individuals, organisations, products and clinical pathways, various methods of foot printing and the advantages and disadvantages of each
9. Discuss psychological aspects of environmental behaviour change (why and how people change or don't change)

Source: East of England Teaching Public Health Network (www.eetphn.org), The Campaign for Greener Health Care (www.greenerhealthcare.org), NHS Sustainable Development Unit (<http://sustainablehealthcare.org.uk>)

'very large power user' according to Eskom. This is the equivalent of 16.8 million kg of carbon dioxide and would require planting 45 073 trees to offset the greenhouse gas emissions. As with all large organisations, faculties need to consider their behaviour in relation to energy use, water use, travel, food consumption, waste and re-cycling, and use of land.

At the Faculty of Health Sciences at Stellenbosch University 'greening up the campus' has been a focus area for the last 2 years. Students, academics and support staff have worked together to create a more sustainable organisation. Current initiatives include retro-fitting the buildings to be more energy efficient, introducing a comprehensive waste and re-cycling plan,

establishing a worm farm to handle the organic waste from the student cafeteria, planting trees to offset research air travel, and researching patterns of staff and student travel as well as the sustainability of the student cafeteria. Faculty media and communication channels have been used to regularly promote more sustainable activities. Students have also introduced an

'Earth Week' festival to draw attention to green issues.

Apart from striving for congruence with more sustainable and healthy living on campus the issues have also been introduced into the undergraduate curricula. A network of medical schools in the UK has reached consensus on the core curriculum as shown in Table 1. The elements of this curriculum can be integrated as a 'golden thread' into the existing modules and teaching activities.¹

Reference available at www.cmej.org.za

SINGLE SUTURE

Immune system may help to trigger the menopause

The immune system may play a role in stopping a woman's biological clock.

John Perry at the University of Oxford and colleagues looked at 43 genomic studies of the menopause, covering more than 50 000 women. By comparing the age that menopause began, Perry's team identified 13 regions with possible links to menopause timing. Three of the regions were housed within genes associated with the immune system. Other regions occurred within genes that control gene repair, regulate hormones and trigger inflammation.

It's not yet clear whether the immune system is the main driver of the menopause or merely a backseat player to biological forces such as hormonal fluctuations. 'This will become clearer when we have identified more of the genetic basis of menopause onset,' says Perry. However, a genetic test to predict when menopause will begin is still a distant prospect.

The link between ovulation and the immune system isn't unexpected; some women with primary ovarian insufficiency, who undergo an unusually early menopause, have an autoimmune disease of the ovaries.

New Scientist, 28 January 2012.