Ideas, resources and support to integrate environmental sustainability in your T&L activities

Workshop for the FBMH T&L symposium of Teaching for the future

4th September 2024.

The University of Manchester

Faculty of **Biology, Medicine & Health**

Huge thanks to the colleagues from various schools and NHS for all their help and resources to create these reference slides.

Contact: Maggy.Fostier@manchester.ac.uk , AD for Environmental Sustainability in FBMH

Content of workshop:

1. The requirements to embed ES in the FBMH curricula, guidance and resources
2. Current practices and plans for 24-25 in FBMH
3. Possible frameworks to shape efforts/actions

Post workshop:

- Facilitators will debrief and put together an action plan, looking for any common ideas/needs/resources across schools. We want to share and reuse as much as we can and we can set collaborative projects.
- We will circulate the material from the workshop and post workshop.

Useful contacts

- SBS: Maggy Fostier
- SHS: Peter Taylor (clinical psychology), Doron Cohen and Paul Warren (psychology), Sally Freeman (pharmacy), Stephanie Greenwood-Davies (speech and language), Christine Greenhalgh (public health)
- SMS: Helen Joplin (medical school), Vitalia Kinakh (dentistry), Sam Freeman (nursing and midwifery)

Existing Social responsibility blogs

- Pharmacy:
- https://blogs.manchester.ac.uk/bmh-sr/2024/01/23/year-4-pharmacy-critical-analysis-and-communication-projects-on-environmental-sustainability/
- https://blogs.manchester.ac.uk/bmh-sr/2023/10/10/year-1-pharmacy-poster-on-environmental-sustainability/
- Medicine:
- https://blogs.manchester.ac.uk/bmh-sr/2024/01/18/sustainability-in-the-medical-curriculum-qepeps-are-going-green/
- Public Health: https://blogs.manchester.ac.uk/bmh-sr/2023/09/20/free-online-courses-on-the-sustainable-development-goals-and-public-health/
- SBS:
- https://blogs.manchester.ac.uk/bmh-sr/2023/10/19/the-environmental-sustainability-projects-legacy-after-two-years/
- https://blogs.manchester.ac.uk/bmh-sr/2023/06/02/6r-widens-its-reaching-reducing-plastics-use-across-campus-and-at-home/
- Psychology: https://blogs.manchester.ac.uk/bmh-sr/2023/10/10/the-1-in-5-project-how-final-year-student-projects-can-drive-sustainability-efforts/
- Dentistry:

Requirements

New requirement = Education for Sustainable Development

QAA: ESD common to all disciplines – specific requirements are subject dependent

Governing bodies: e.g. Medical Schools Council

Accreditation bodies:

- **GMC** (section 25: health promotion, illness prevention, and sustainable healthcare) [3, 4]
- **GPC** mapping of ES across 55 LOs
- **GDC:** ILO P 3.11 and P 3.12



Government: Health and Care act 2022: use NHS resources sustainably and meet **Greener NHS climate targets**

Scientific communities: e.g. American Medical Association [2] , UK Concordat for Sustainable Research and Innovation (PG)

UoM: ES strategy

Employers: green skills in demand

Students:
NUS survey: 67% want ESD
Planetary Health report Cards

1) Environmental crises implications on health, ecosystems and food security.
2) Environmental impact of healthcare, research, agriculture, and pharmaceutical sectors.
3) Study or monitoring of the environmental crises
4) Principles of sustainable healthcare, research, agriculture, and pharmaceutical sectors (+ more solutions/tools for tomorrow: C capture, new biomaterials, pollutions/waste/recycling solutions, nature based solutions).

Some definitions

Sustainable development: a way of developing that meets the needs of the present without compromising the ability of future generations to meet their own needs. Integrated approach that considers environmental concerns along with social and economic development. (UN)

Environmental sustainability (ES): responsible management of natural resources to meet current needs while also ensuring that future generations can meet their needs. It involves balancing ecological, economic, and social goals. (UN).

Environmental sustainability (ES): meeting current and future needs within ecological constraints. The economy is a strategy to make money while achieving sustainability. (This short UN SDGs video)

Education for sustainable development (ESD): ESD empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society. (UNESCO)

Example: QAA Benchmarks: Psychology (2023)

- Psychology degrees should produce graduates who are psychologically literate, with skills that can be applied to global issues such as environmental sustainability and social justice.
- Psychology graduates are equipped to work towards sustainability by focusing on the interrelationships between environmental, social, and economic factors.
- Psychology plays a vital role in addressing the human dimensions of the 17 UN SDGs,
- Psychology's contribution is essential in interdisciplinary teams, especially where behaviour change is necessary for actions like climate change mitigation.

Example: LO from GDC linking to ES (2023)

P 3.11	Describe the main principles relating to sustainable oral health care, both environmentally and in terms of patient compliance, and the factors that might affect implementing a sustainable approach
P 3.12	Evaluate and apply the evidence base in relation to the environmental impacts of common treatment methods and approaches to the delivery of oral healthcare

Sustainable healthcare principles

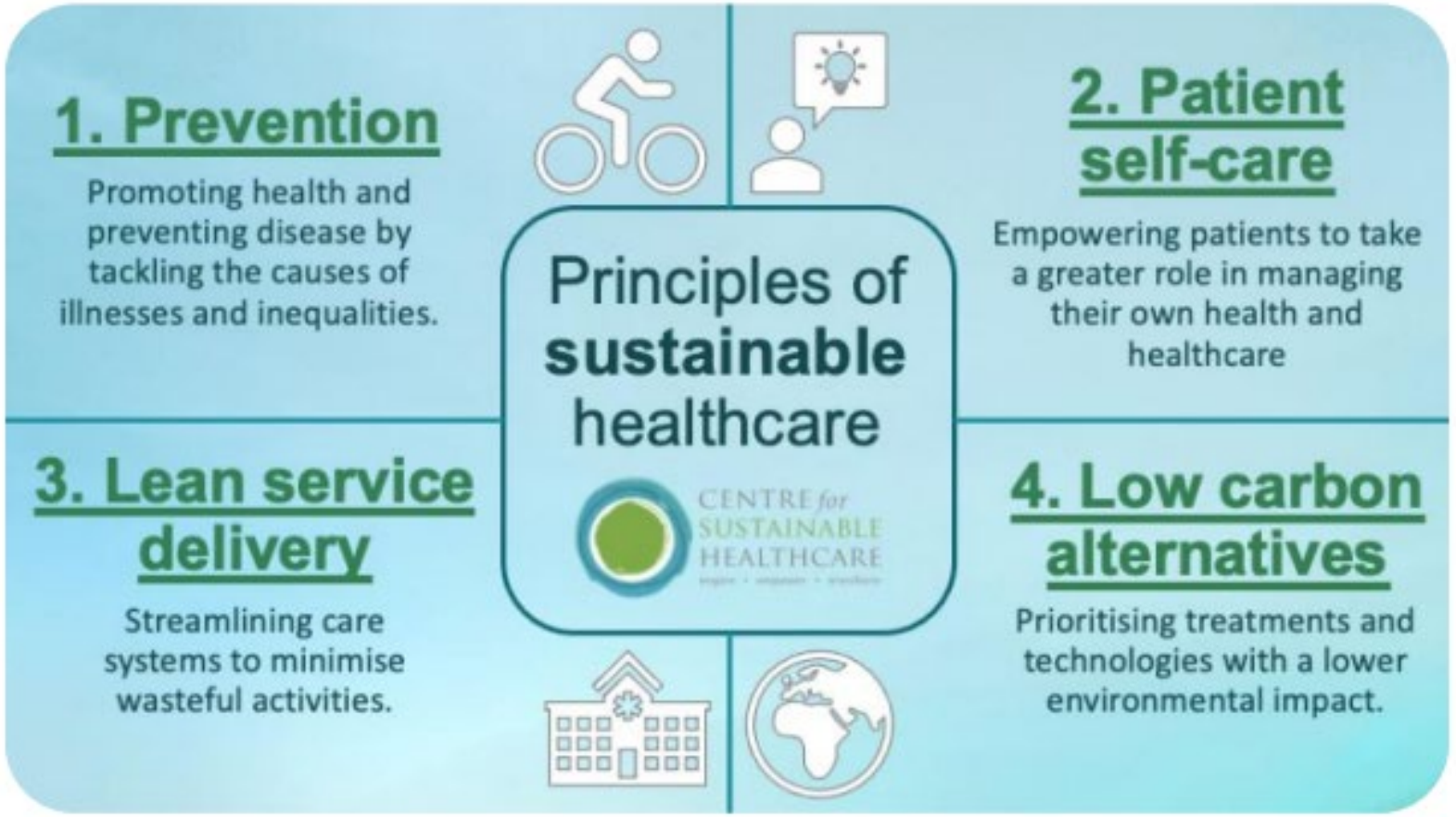


Figure 4: The four principles of sustainable healthcare in descending order of importance. Source: adapted from Mortimer et al. (2018).

Reduce medicines where possible:

- Digital health tools
- Mind based solutions/tools
- Nature-based solutions
- Better diagnostic tools
- Targeted treatments (cure better than symptoms management, personal medicine, improved delivery, chronobiology, digital tools for monitoring, ...)
- Integrated care for better diagnosis and more appropriate treatment (linked to streamlining)
- Functional food
- ...

Principles adapted for sustainable dentistry

CENTRE *for* SUSTAINABLE HEALTHCARE
inspire • empower • transform

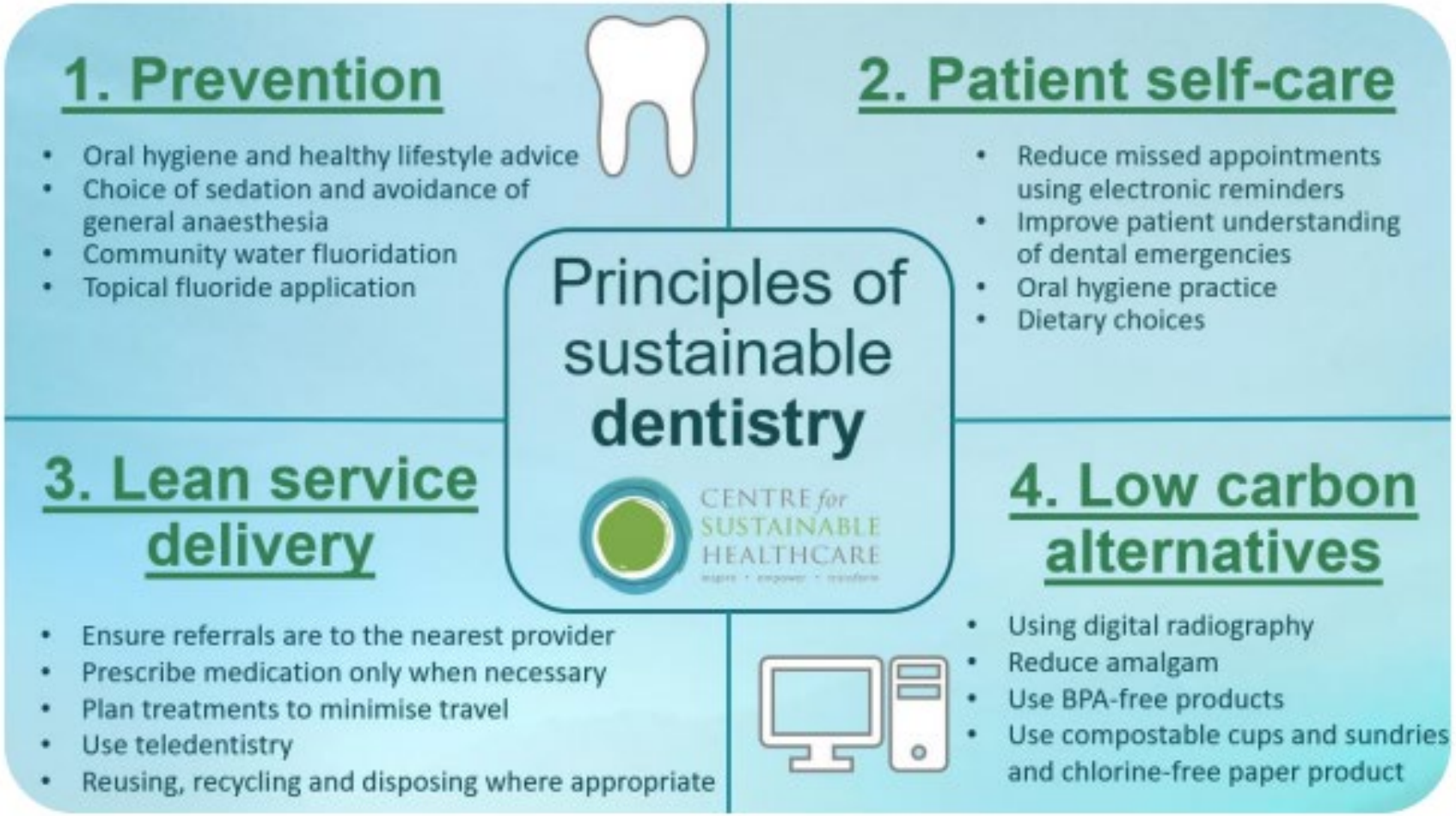


Figure 5: Examples of the four principles of sustainable healthcare when adapted for dentistry. Source: adapted from the Centre for Sustainable Healthcare (2016).

Barriers, challenges, and some reassurance?



- **There's no room for it in the curriculum.**

A lot should integrate as part of existing curriculum – it fits well with our Faculty curricula

- **It does not fit with my teaching.**

For most of us – it is a matter of reframing some aspects of current teaching with an ES optic

- **I don't know anything about sustainability.**

CC is the greatest threat/crisis of 21st century and we all have to live with it and think about it. There many existing resources and we are trying to plough through them and help train everyone as easily as possible in the process

- **It's our job to teach students – not to preach to them!**

We need to train the professionals of tomorrow's world. We are also training people likely to be highest earners/emitters and having agency and influence – we also need to promote a low C lifestyle

- **There is no practical guidance on how to incorporate it into the syllabus.**

There is some guidance for some disciplines, and we are building a network to help each other.

- **What are we trying to achieve?**

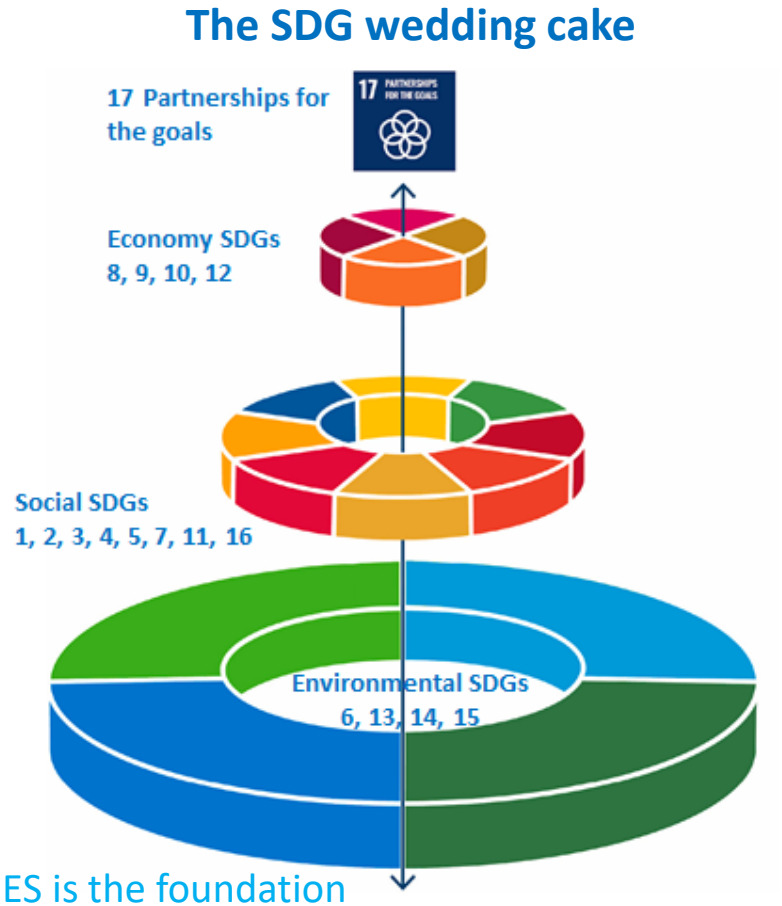
Raise awareness among students and staff about sustainability challenges and develop a skillset that is future-focused and globally applicable (QAA)

Guidance and resources

UN 17 SDGs

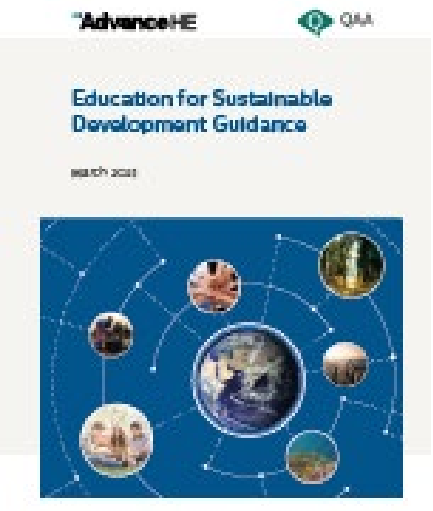
In 2015, the UN defined 17 SDGs to be used by all to for health, equality and to save the planet by 2030 without leaving anyone behind.

This 5' video establishes the principles behind the SDGs and some limitations.
It is key to consider how the SDGs link together to build a sustainable world (*system thinking – next slides)*.
The SDGs tracker from our world in data presents each SDG with their targets and progress so far

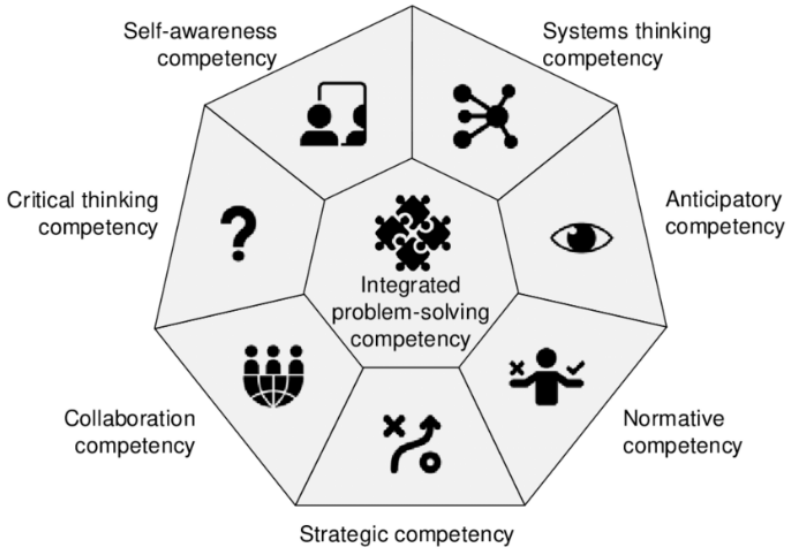




QAA guidance on ESD
8 UNESCO competencies



See section 3



Critical thinking: Question norms, practices and opinions; reflect on one's own values, perceptions and actions; and take a position in the sustainability discourse.

Self-awareness: Reflect on one's own role in the local community and (global) society; continually evaluate and further motivate one's actions; and deal with one's feelings and desires.

Systems thinking: Recognize and understand relationships; analyse complex systems; think of how systems are embedded within different domains and different scales; and deal with uncertainty.

Anticipatory: Understand and evaluate multiple scenarios for the future – possible, probable and desirable; create one's own visions for the future; apply the precautionary principle; assess the consequences of actions; and deal with risks and changes.

Normative: Understand and reflect on the norms and values that underlie one's actions; and negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.

Strategic: Collectively develop and implement innovative actions that further sustainability at the local level and further afield.

Integrated problem-solving: Overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development, integrating the abovementioned competences.

Collaboration: Learn from others; understand and respect the needs, perspectives and actions of others (empathy); understand, relate to and be sensitive to others (empathic leadership); deal with conflicts in a group; and facilitate collaborative and participatory problem solving.

Medicine: guidance and resources



EDUCATION FOR SUSTAINABLE HEALTHCARE Guide

A curriculum for the UK

1: Impact of climate and ecological crises on health, health systems and vulnerability factors
2: principles of a greener healthcare

UK/International

- Centre for Sustainable Healthcare - https://sustainablehealthcare.org.uk/ [sustainablehealthcare.org.uk] - networks, events, resources, **training**
- UK specific – Health impact of policies to reduce GHGs.
- Sus QI resources – open access and info specifically on Sustainable Quality Improvement https://www.susqi.org/ [susqi.org] – nice to measure impact.
- Videos (fab) and resources from Royal Society of Medicine - Green surgery
- The Lancet Planetary Health Journal https://www.thelancet.com/journals/lanplh/home
- **Greener NHS**: Greener NHS (england.nhs.uk) – case studies: Greener NHS » System progress (england.nhs.uk) + North West case studies
- Primary care green network: https://www.greenerpractice.co.uk/

UoM resources:

- UoM free Green QEPEP toolkit: from Sabia Dayala. Here is the blog - Please let Sabia if you use/adapt it.
- UoM free Public health SDGs course Here is the blog . Please let Christine Greenhalgh if you use/adapt it.

MFT-NHS: Manchester Foundation Trust resources. ES Strategy: 2022-25 , Annual report 22-23, Monthly bulletins, Monthly recorded webinars (great) and archives. Contact timetoact@mft.nhs.uk (Elizabeth Murphy and Sarah Hewett) to subscribe.

More Events | Sustainable Healthcare Networks Hub

Other health guidance/resources

- **Pharmacy**: Royal Pharmaceutical Society and Sustainability in ABPI (pharma industry). GPhC mapping of 55 LOs where ES could be addressed (great work!)
- **Dentistry**: College of general dentistry: (great website- all in one!) NHS e-learning intro, CPD webinar, guide, MOOC (from FDI), guidelines, toolkit and accreditation...
- **Nursing**: Royal college of nursing
- **Optometry**: Guidance from European Council, some impact data

- **Greening labs**: LEAF and 6R inductions/training from FBMH

SHS and SMS curriculum mapping and resources

- ES in curriculum SHS – March 2026: XLS

- Medicine curriculum mapping with suggested ES resources or action for each ILO: Aug 2025- XLS

UoM ES campaigns: learn/take part (volunteer/project student)

Central ES team – year calendar (NEW)

SEPT	SMALL ACTIONS, BIG IMPACT
OCT	FOOD FOR THOUGHT
NOV	LIVE WHAT'S LEARNT
DEC	PURGE DON'T SPLURGE
JAN	JAN-NEW-ARY
FEB	TOGETHER FOR TOMORROW

MAR	THINK BIG, INNOVATE GREEN
APR	IT'S IN OUR NATURE
MAY	WELLBEING IN FULL BLOOM
JUN	SUSTAINABLE STEPS
JUL & AUG	THINK TWICE, BUY RIGHT

Symposium, exhibition, newsletter, Stopford quads, climate cafes, more?

- Medicine and UoM T&L symposia (June)
- FBMH ES showcase (May-June)
- ES support (small fund) for conferences (contact Maggy Fostier)
- Blogs on T&L activity for FBMH ES Good Newsletter (contact Maggy Fostier).
- Stopford back quad plans for raised beds for staff/students (contact Jenny Herbert)
- Climate cafes (Eventbrite) (Museum and Public health)

- Possible exhibition: One day in medicine in 2036 (and 1936?). Or Healthcare in 2°C world/ Net zero world (2050?)
- Possible online exchange network (UK/global) for our students to share practical experiences, initiatives, start collaborations? (e.g. Nature Positive Alliance)

Human resources: Project students, volunteers

Project students

- Own discipline: SBS (ES, Sci comm, etc), Health Sci: Clinical audits, quality improvements.

- **Psychology: Y2 placement**
  - 30 hrs: Anytime between Oct-May
  - Any project (data analysis (quant/qual), creating surveys, audits, data collation, creation of resources...)
  - Flexible: no report required/anyone can supervise
  - Advert ideally before Oct – Contact: shs.placements@manchester.ac.uk

- **PIP: Y2 PhD student**
  - 12 weeks (one block or 2x 6 weeks).
  - Contact: mateusz.przygoda@manchester.ac.uk.
  - Advert in semester 2 – ideally February

Volunteers

- Sustainability champions (contact)
- Wellbeing champions (contact)
- 6R champions – plastic focus home, campus, labs (contact Maggy Fostier)
- Nature Positive champions (contact Maggy Fostier)

Living labs

- Living labs: 2 min video
- Submit SDG research brief - can be undertaken by any UoM student,
- Ask your student to select a research brief for their assessment
- Access past reports (some on diet, well being and green spaces at the moment)

Projects	Psych Y2 placement	Final UG psych	Final SBS	
Hours	30hrs (2hr/wk or bulk)	400 hrs	400 hrs	
Supervision	Anyone	Academic	Academic	
Report	No	Yes	Yes	
Titles	Sep	Mar/Apr	Apr/Sep	
Sept				
Oct				
Nove				
Dec				
Jan				
Feb				
Mar				
Apr				
May				
Jun				
Jul				
Aug				

Existing activities, resources and plans

Inductions

- Compulsory for all? Optional?
- F2F lecture or workshop
- Online
- Quiz

1. General on SDGs (SBS)
2. General on climate change and ecological crises + climate actions (UoM/discipline/personal) (SBS, Medicine)
3. Specific: Green labs (PGs SBS and STP)
4. Specific: Sustainability for Clinical Scientists (PG STP)
5. Specific: Public Health (UG/PG) **+ on request**: lectures/interventions on Climate change and health + Public health benefits of green and blue spaces
6. Specific: Psychology (UG/PG)
7. Specific: Medicine: 3rd year inductions, 5th years public health, and CPS away days
8. ES/SDGs inductions for summer schools.

Plans 24-25 →

Develop online bitesize intro for 1 based on existing UCIL unit (Lisa Swanton and Catherine Millar)

Develop a quiz to accompany 2 (live/online) (Maggy Fostier)

Interface discipline ↔ES or SDGs

Compulsory/optional. Need to reach all students to embed

- Units dedicated to ES (SBS, HSTM, Public Health)
- Isolated lecture(s) within a unit or supplementary course material/online resource- boost where possible using existing resources or project students – following SDG mapping by students?
- Activity: poster, essays, reviews, design experiments/protocols, solve wicked problems
- Integration in study cases (dentistry) – needed for medicine
- Online courses: free online course Public Health and SGDs) - Project in SBS for bite size intro on SDG and my discipline based on current UCIL unit
- Reflective portfolio/discussion: on personal actions, clinical practices (medicine has started)

1) Environmental crises implications on health, ecosystems and food security.
2) Environmental impact of healthcare, research, agriculture, and pharmaceutical sectors.
3) Study or monitoring of the environmental crises
4) Principles of sustainable healthcare, research, agriculture, and pharmaceutical sectors (+ more solutions/tools for tomorrow: C capture, new biomaterials, pollutions/waste/recycling solutions, nature based solutions).

Posters: Y1 Pharmacy and Y1 SBS following lecture

Pharmacy: By all Y1 students

- Lecture on green chemistry followed by assessed individual poster: design a poster on a healthcare topic of their choice which links to ES and/or the SDGs. Blog for more info and examples (marking scheme available)

SBS: By all Y1 students (launch 24-25)

- Resource and lecture on links between biosciences and ES followed by assessed group poster (part of tutorial): design a bioscience poster exploring its link to ES.

Essay, dissertations, or equivalent can cover these topics

1) Environmental crises implications on health, ecosystems and food security.
2) Environmental impact of healthcare, research, agriculture, and pharmaceutical sectors.
3) Study or monitoring of the environmental crises
4) Principles of sustainable healthcare, research, agriculture, and pharmaceutical sectors (+ more solutions/tools for tomorrow: C capture, new biomaterials, pollutions/waste/recycling solutions, nature based solutions).

1. Impact of environmental & biodiversity crises on health, food security, ecosystems

- Effects **OF**
- changes in temperatures, season patterns, precipitation levels, extreme weather events, sea levels, pH of water, O_2/salt in water, atmospheric GHGs
- Biodiversity losses
- Man-made pollutants (air, water, land)

ON
health (physical/mental),
healthcare,
pharmaceutical industry,
agriculture
or ecosystems

Environmental Sustainability

Interface

2. **Environmental impact of research, healthcare sector (human/animals) and agriculture**

- Effects **OF** bioscience research, healthcare, pharmaceutical industry, agriculture

- **ON**:
- Climate change
- Man made pollution
- Biodiversity loss
- Ecosystems disruptions

Biosciences

3. **How your discipline helps study/monitor environmental impact**

- Field studies to monitor biodiversity/ impact of new environmental conditions (CO2, pH, T, salt)
- Bioindicators or biosensors to monitor pollution or quality of air, water, soil
- Study of man-made substances for possible ecotoxicity or eutrophication
- Study of factors contributing to soil quality, crop/animal health to ensure food security.
- Study of factors contributing to ecosystem health, restoration, or adaptation to ensure sustainability and limit impact on food security or health (zoonotic diseases), biodiversity loss.
- Psychology:
  - Behaviours driving over-consumption/addiction or harming the environment.
  - Factors influencing meaningful happiness, self-satisfaction.
- Science and society:
  - Impact of education on natality, public health and environmental policies.
  - Impact of wrong or lack of policy/drivers/regulations

4. **How your discipline contributes to possible solutions, mitigations or adaptations.**

- Solutions to green research, healthcare or pharmacology (reduce, reuse, or use more sustainable resources)
- Remedy pollution and ensure safe water supply
- Design sustainable bio-products or bio materials fit for a circular economy
- Design ways to ensure food security with lesser impact on environment (sustainable agriculture, gene editing/selection, alternative protein sources, synthetic food)
- Design nature-based solutions to restore eco-systems, capture carbon, protect from extreme weather events.
- Design bio-based energy, materials or systems that help capture carbon or methane.
- Develop tools to make healthcare shift from reactive (bigger impact) to preventative and more targeted treatments, including green and social prescriptions, digital health tools, placebo/mind based techniques to reduce pharmaceutical consumption.
- Design diagnostic and biosafety tools/treatments to restore ecosystems or reduce biodiversity loss
- Implement effective behavioural change approaches to promote a more sustainable life
- Importance of science communication and policy/drivers/regulation

Dentistry embeds ES in PBL cases (23-24)

- **Embedding sustainability in PBL cases** (Y1, Y2 and Y3) to incorporate more sustainability and action on climate change elements for discussion:
  - **Y1**
    - Case 3: Mary's swollen face – students are introduced to antibiotic resistance and the appropriate use of antibiotics in dentistry;
    - Case 4: Mrs. Brown's dry mouth – students are introduced to eco-friendly mouthwash or mouthwash tablets that contain fluoride (eco ethics when it comes to dental care products;
  - **Y2**
    - Case 5: Marta Theroma – students are introduced to the current amalgam waste disposal including the amalgam separator requirements
  - **Y3**
    - Case 6 Abnormal Growth – students are introduced to environmental effects/benefits of smoking cessation, e.g. helping a patient quit smoking prevents tobacco-related illness and reduces the carbon footprint of both cigarette production and the health care burden of tobacco-related illness.

Psychology: Design an evidence based intervention / experiment

- Optional but popular: Following 2 lectures showcasing interface between ES and psychology (social, clinical and individual), students in a group choose an aspect of ES that interests them and develop an evidence based intervention (no time to roll it out so only theoretical)

- Plan for 24-25: For all students. Dealing with wicked problems.
- Choose 4 **wicked problems** (1 in ES) and look at what psychology has done so far. Propose a new experiment. Class vote for best. May try one winning proposal if feasible.

- Nursing used to do something on wicked problems?

Projects

- ES option added to existing offering
- Training session/resource may be required for students (staff?) – exists in SBS and medicine.

Projects support:

- Creation of resources, training, interventions to help embed ES in curriculum
- Curriculum mapping, audits, need analysis
- Green NHS, labs, campus
- UoM outreach programme (campus and external)
- Local/global organisations

Plans 24-25 → SBS

Pilot for a sustainability statement/reflection at the end of lab project thesis (with a training package)

Aim to ask for sustainability/ SDGs reflection for all project reports on top of existing reflection on skill development.

Sustainability reflective paragraph already done in Glasgow (Yvonne Dempsie) and Leeds (Dave Lewis)

Y4 pharmacy: Critical Analysis and Communication Projects on Environmental Sustainability

Blog for more info.

Critical Analysis and Communication (CAC).

Example of activity: **'Ask the pharmacist' Q & A** (10 min, 1 slide).

ES questions included:

- "I have heard that CFCs may be in my asthma inhaler. What are CFCs and why should I be concerned?"
- "Is it OK to flush my waste medicines down the sink?"
- "Please can you advise how to recycle medicine packaging, especially empty blister packs?"

Protocol project : executive summary (abstract), oral presentation and a written report, which includes the design of a poster

Design an intervention to test an unmet ES need

- Investigating the impact of a climate coping educational intervention on Climate Anxiety scores in Pharmacy students at UoM
- The impact of climate change on individual health: respiratory complications
- The environmental impact of medicines: investigating the effect of progesterone on zebrafish
- Exploring the impact of medicine disposal on the environment and methods of reducing industrial and individual footprint

Understand and design an intervention to reduce carbon emissions in the NHS with respect to one of the following:

- Transport for patients, staff and visitors
- Single use plastics/switch to bio-based polymer
- Anaesthetic gases
- Inhaler choice
- Sustainable prescribing (medicine waste)
- Waste: Life cycle assessment

Y3 SBS current projects can incorporate ES topics

Science Communication (public)
Engaging UK public via social media on non bee pollinators in the UK





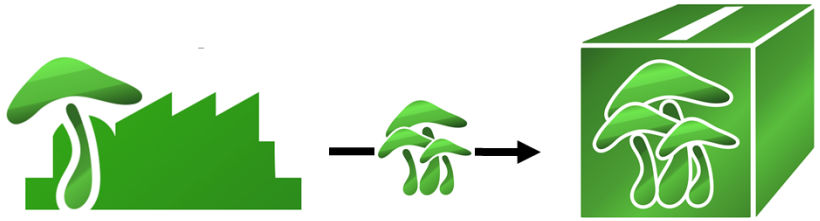
Bioscience Stakeholder project:
Factors influencing rewilding eco-tourism in the UK?

Science Communication: (education)
Engaging students in UoM and Malaysia with an e-learning package on sustainable palm oil



Enterprise:
Spin-off company based on mycelium technology

MycoTech

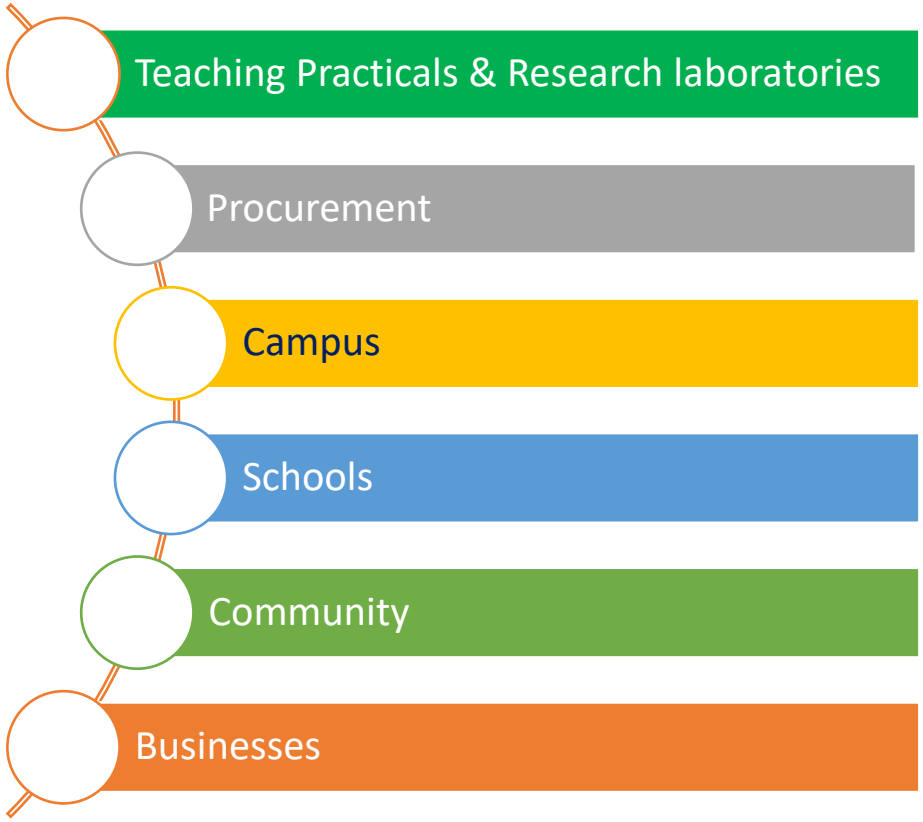


Fungal degradation of end of life plastics.

Sell mycelium as biomaterial for insulation, building material, packaging, and fashion.

Environmental Sustainability projects.
Includes specific training in semester 1 – helps with our ES agenda

SBS. ES projects (ESP) are action-centered for any setting





Themes so far:

- Greening labs
- Learning tools and engage
- Valuing nature (incl green prescription)

Type of work:

- **Audit/needs analysis**
- **Explore via desk, primary research (surveys) or testing of new product, protocol, strategy.**
- **Intervention/resource creation**
- **Impact evaluation**
- **Evidenced recommendations**

21-22: pilot with 3 students, 22-23: 15 students, 23-24: 17 students.

Y3 SBS students, sem 1 training, sem 2 project wk1-8 (2.5 day/wk).
Need academic supervisor

Psychology initiative: make 1:5 Projects focus on ES

The idea: ***The number game:*** *In the UK, every year, ~ 500,000 students complete an undergraduate degree. In the final year, almost all students, in collaboration with an expert academic supervisor, do a substantial piece of advanced work: a research project, a composition, a dissertation, a show etc. If 1 in 5 of these pieces of work focused on environmental change there could be a significant impact.*

To learn more and get involved visit the **1-in-5 Project website**.

Psychology topics

- Cultural Views on Sustainability: Investigating how varied cultural backgrounds influence perceptions of environmental challenges and collective versus individual responses.
- Environmental Messaging: Assessing the efficacy of local vs. global environmental communication strategies.
- Climate Change Denial Psychology: Unravelling cognitive biases and psychological reasons behind denial to encourage acceptance.
- Eco-Anxiety: With increased exposure to distressing climate change imagery, understanding its psychological toll and developing coping mechanisms is critical.



See blog and next slides for more info

- Environmental Education: Evaluating and enhancing the impact of sustainability education across various platforms.
- Environmental Attitudes: Analysing the nuances between conscious and unconscious environmental attitudes and their impact on consumer behaviour.
- Environmentally aware behavioural change: Assessing the impact of carbon footprint labelling on food choices

Possible **ES clinical placements** for students in medicine, nurses, midwifery, pharmacy, public health, physician associates, psychology

How could students help with Green NHS agenda:

audits, surveys, testing, exploration, promotion (changing behaviour/resources/training), impact evaluation

- Support the four principles of sustainable healthcare: clinical practice: disease prevention and health promotion, patient education and empowerment, lean service delivery and preferential use of treatment options and medical technologies with lower environmental impact.
- A brainstorm with sustainable team in MFT led to the following project ideas
  - Reducing food waste
  - Green prescription
  - ReviPromoting EcoFlex 4 a government incentive to insulate house to patients suffering from poor housing health issues.
  - Reviewing clinical activities using the Green ED framework (Posters next slide)
    - Waste segregation – improving recycling
    - Promoting to staff Reducing IV cannulation
    - Promoting to staff and patients dry powder inhaler
    - Promoting to staff and patients reduction of gloves/PPE
    - Rationalising the surgical set – less disposable / more reuse
    - Developing the green operating theatre checklist
    - Reducing single use plastics
    - Reviewing over-prescription of medicine or blood tests
    - Establishing mutually satisfactory rules of engagement with digital health care and remote consultations.

APEP (Y3 medicine): Applied = research project

- Project title required: 27th October
- Possible ethics approval application in semester 1
- Project length 8 weeks from 22nd April- 14th June.
- Assessment: research report (80%) and oral presentation (20%)

- Full description.

Project types:

- Research (laboratory-based)
- Research (non-laboratory)
- Bioinformatics
- Audit
- Service evaluation
- Systematic review
- Critical appraisal
- Other non-research

GEM PEP

- Runs at same time as APEP for graduate entry medicine students
- 26 April – 25 June 2026
- Supervisors from SMS
- Students can choose from 5 themes, including sustainable healthcare
- Literature review and poster presentation
- https://www.onemedlearn.manchester.ac.uk/activities/y3-graduate-entry-medicine-pep-gempep-supervisors/?uID=34589&programme=mbchb&prog_year=6&ac_year=2025-2026

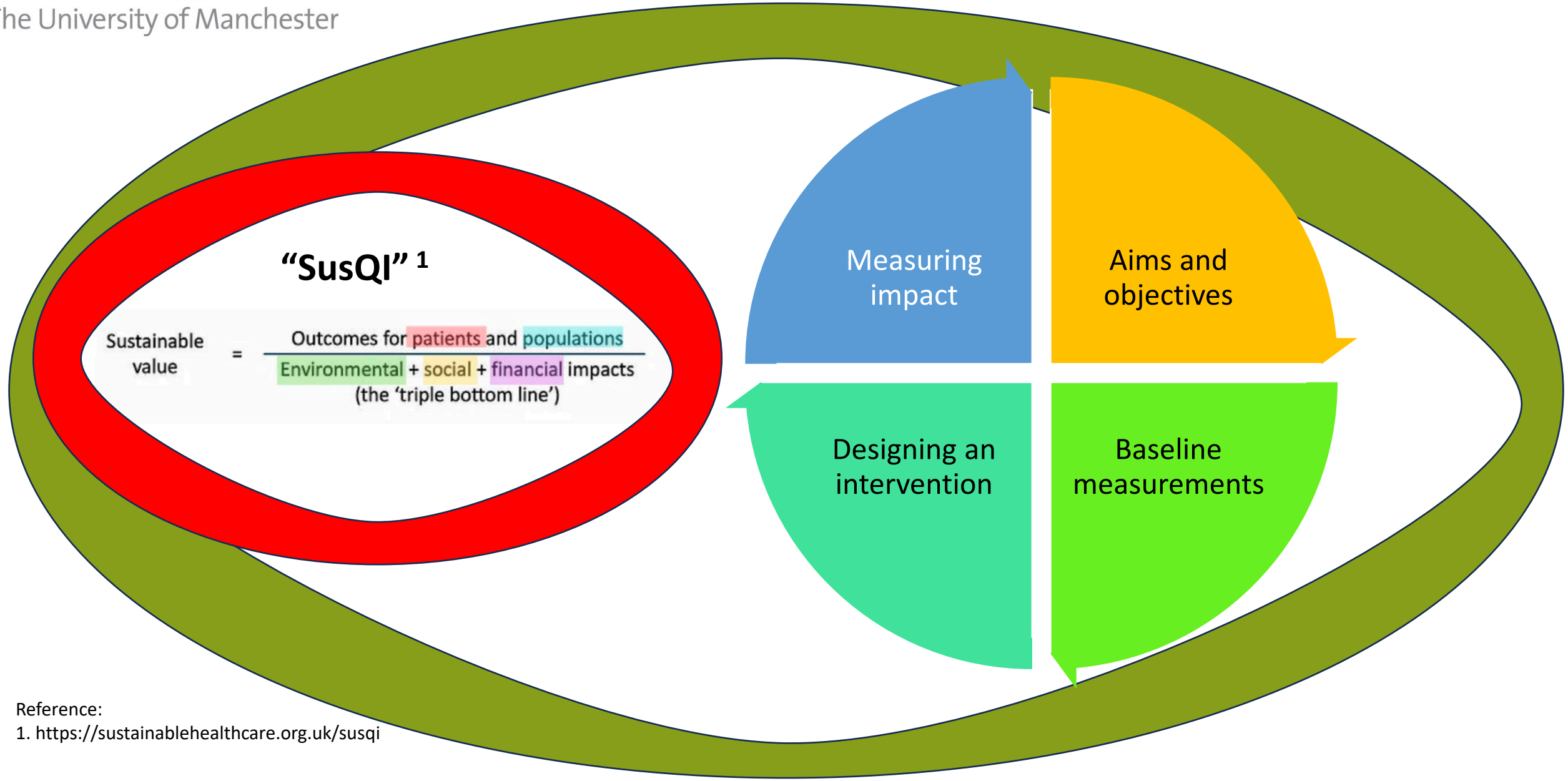
QEPEP (Y5 medicine): quality improvement project

Blog for more info

- Project title required: mid December
- Project length 4 weeks – runs in two blocks (2023: 27th March until 21st April OR 24th April 2023 until 19th May)
- Assessment: written assignment. Either a Lay document or a Quality and Evidence report, depending on the project undertaken.
- Full description.
- Green QEPEP toolkit created by Dr. Sabia Dayala for GP and primary care settings.

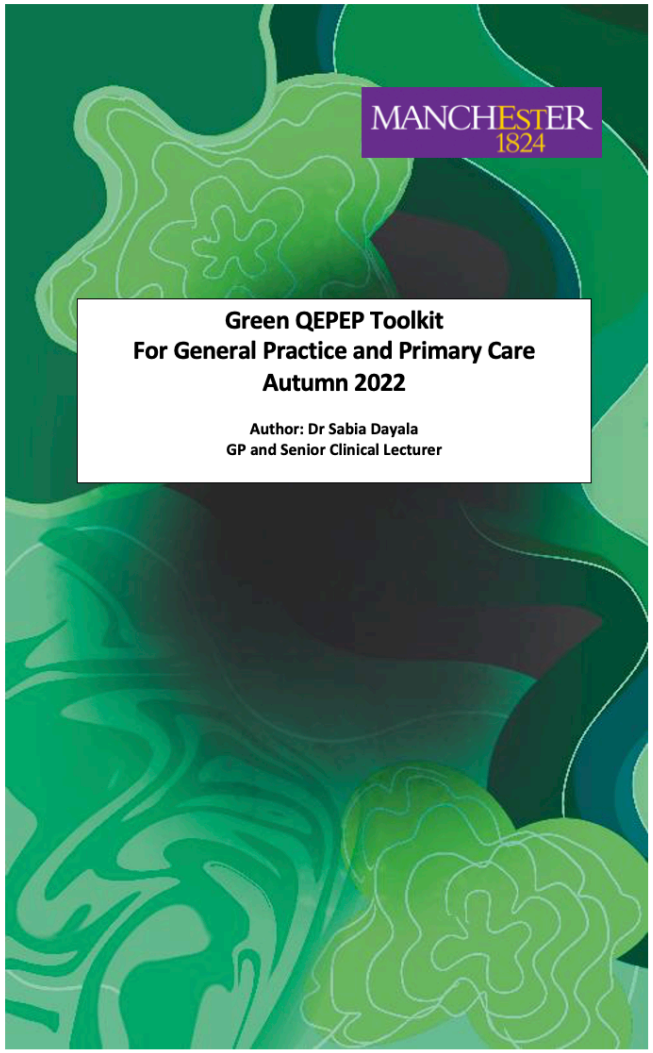
MANCHESTER 1824
The University of Manchester

How-Methods



Reference:
1. https://sustainablehealthcare.org.uk/susqi

Resource: ”Green QEPEP” toolkit



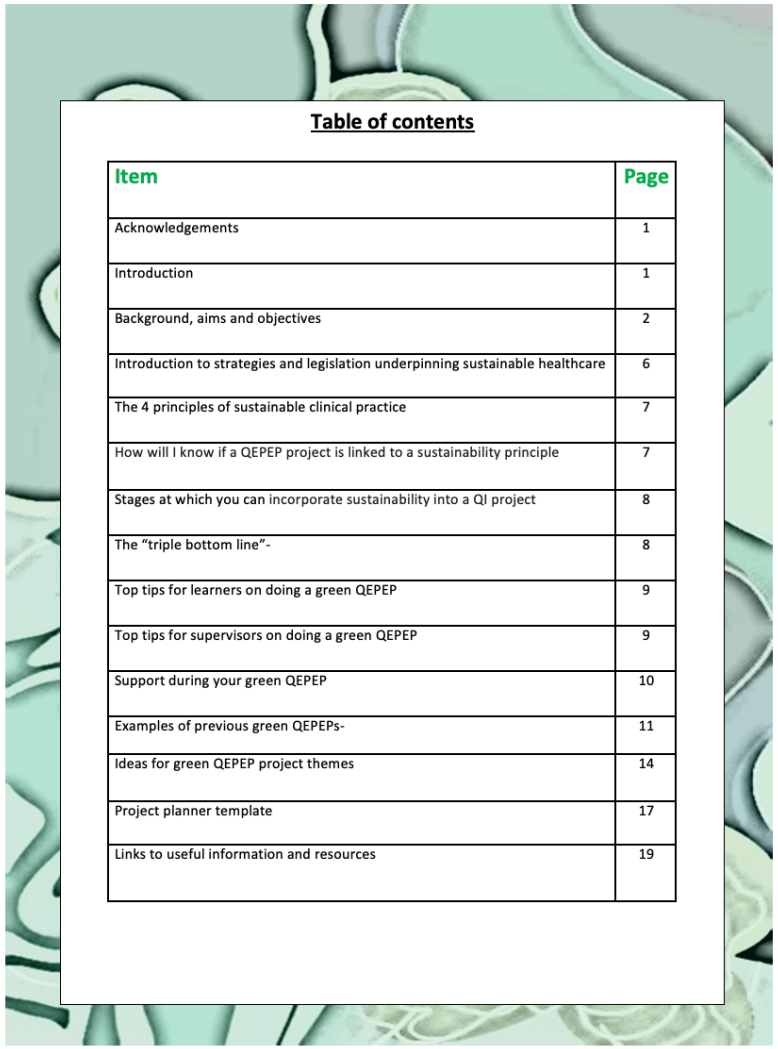


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Staff training

- Prime training for clinical supervisors in medicine.
- QEPEP resource
- Green labs in FBMH
- Sustainable healthcare in NHS
- Sustainable healthcare center trainings
- Mutual learning will take place via student ES activities and projects.
- We think we need to develop an online induction (SDG and ES interface with discipline) – what are your views?

✓e.g. Being honest, with students, about Climate & Ecological Collapse – (*Silke Conen and David McKelvey)*

Greening curriculum delivery

- 6R and LEAF review of practicals (contact Maggy for training package/ get a GTA)
- Collection for laundry of labcoats in SBS, medicine, (pharmacy soon?)
- Paper less delivery
- Online delivery when appropriate (saves travelling)
- Modules on digital skills/tools

Frameworks that could help shape efforts/actions

Challenges/opportunities – new skill set for staff

Challenge 1: Key UN competencies are new and need an interdisciplinary approach

Opportunities:

- UoM= mini society with real world complex projects/wicked problems
- Plethora of authentic project/experiences
- Use comparisons with healthcare, health, eco-systems to approach these skills
- AI may be a tool to help, not cheat.
- System frameworks: Planetary health, One health, UoM
- Interdisciplinary projects/units or equivalent for healthcare

UNESCO ESD Key Competencies for Sustainability
Systems Thinking
Anticipatory
Normative
Strategic
Collaboration
Critical Thinking
Self-Awareness
Integrated Problem-Solving

Challenge 2: Promote values and motivations to make students utilise skills for a better world for all.

Opportunities:

- UoM, FBMH, NHS SR values and goals (must lead by example and multi disciplinary research)
- Many international students → opportunity to develop collaboration- empathetic skills (global North/South).
- Take part in global networks of exchange → join existing network/alliances?

Planetary Health Alliance

Planetary Health:

- Inter-disciplinary approach to understanding and addressing changing world and its implications for life on earth
- More than climate change (e.g. air pollution, antimicrobial resistance, etc.)



Planetary Health Alliance:

- Partnership of over 450 organisations from 75+ countries
- Many universities and research institutes
- Focus on collective action in addressing planetary health
- Sharing of resources and best practice, developing collaborations, organising action

https://www.planetaryhealthalliance.org/planetary-health

PHA core aim:

“To promote, mobilize, and lead an inclusive, transdisciplinary field of Planetary Health and its diverse science, stories, solutions, and communities to achieve the Great Transition, a comprehensive shift in how human beings interact with each other and Nature, in order to secure a livable future for humanity and the rest of life on Earth.”

Joining the PHA

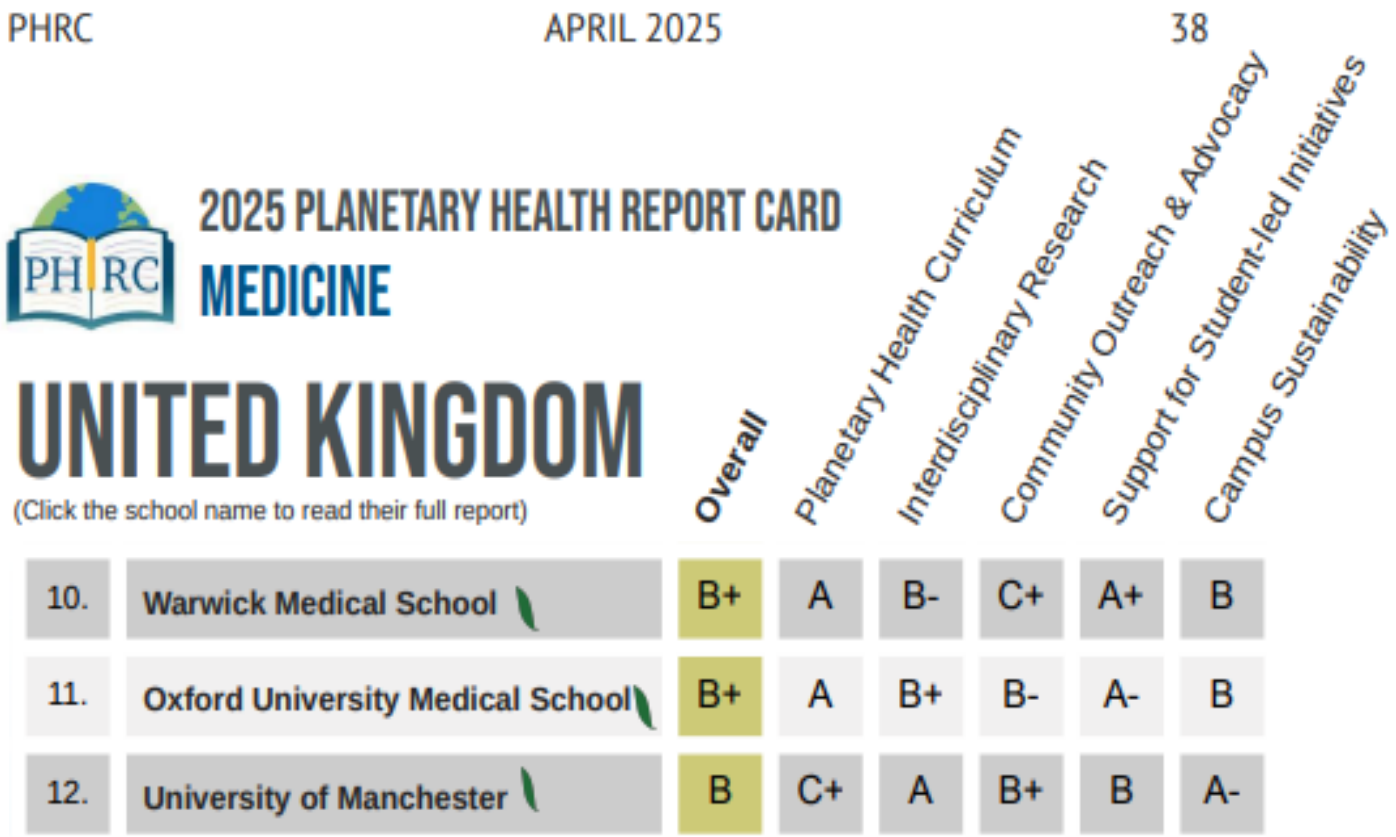
- Plan for SHS to apply to join PHA.

- Possible benefits:
  - Access to material and resources that could be used in teaching
  - Sharing of best practice and ideas
  - Collaboration with other organisations, researchers, etc
  - Opportunities for students
  - Access to conferences and events

- However – involvement has to be more than a tick-box exercise
  - Should be linked to a genuine commitment to action



Student led: Planetary health report cards: https://phreportcard.org/



PHRC APRIL 2025 38

2025 PLANETARY HEALTH REPORT CARD

MEDICINE

UNITED KINGDOM

(Click the school name to read their full report)

		Overall	Planetary Health Curriculum	Interdisciplinary Research	Community Outreach & Advocacy	Support for Student-led Initiatives	Campus Sustainability
10.	Warwick Medical School	B+	A	B-	C+	A+	B
11.	Oxford University Medical School	B+	A	B+	B-	A-	B
12.	University of Manchester	B	C+	A	B+	B	A-

Our students do not report for, Pharmacy, Nursing.

We are slowly improving the provision of ES in the curriculum in medicine.
2024 we were ranked 18 with a C

The report helps framing how we should support our students and our gaps

Student led: Nature positive ambassadors.

https://www.naturepositiveuniversities.net/

Mission: no further biodiversity loss by 2030 (aligned with COP)
UoM is a member and our students can be ambassadors.

Student ambassadors join international network to link up with students around the world wanting to make changes for nature on their campus and at their institutions and start a Nature Positive journey with us.

They are provided with a toolkit with activities to run on their campus and they should share actions for nature on social media with the **#GenerationRestoration.**

They can also join our friendly Slack channel and monthly drop-in workshops to get inspired and support each other. → this is an important part – we need to exchange with others internationally – this is a global challenge



What else? How to promote a student-led

KNOWLEDGE EXCHANGE

- How can we maximise the fact that we have so many international students on campus?
- How can we maximise the elective experiences abroad?
- How can we ensure that the knowledge and useful resources generated by projects and our students are disseminated instead of gathering dust?

Extra resources

Link discipline with ES

Climate change impact on health- videos and resources from Royal Society of Medicine

1. 

Health Emergency of Climate Change | Episode 1: An introduction
Royal Society of Medicine • 4.4K views • 2 years ago

2. 

Health Emergency of Climate Change | Episode 2: The dangerous air we breathe
Royal Society of Medicine • 1.5K views • 2 years ago

3. 

Health Emergency of Climate Change | Episode 3: Skin in a warming world
Royal Society of Medicine • 1.1K views • 2 years ago

4. 

Health Emergency of Climate Change | Episode 4: Hazardous temperatures and cardiac health
Royal Society of Medicine • 1K views • 2 years ago

5. 

Health Emergency of Climate Change | Episode 5: Damaging diets and dangerous water
Royal Society of Medicine • 880 views • 2 years ago

6. 

Health Emergency of Climate Change | Episode 6: The unborn child and children's health
Royal Society of Medicine • 652 views • 2 years ago

7. 

Health Emergency of Climate Change | Episode 7: Mental health in a planetary crisis
Royal Society of Medicine • 599 views • 2 years ago

8. 

Health Emergency of Climate Change | Episode 8: Building a greener health system
Royal Society of Medicine • 559 views • 2 years ago

9. 

Health Emergency of Climate Change | Episode 9: Planetary health through the lens of the pandemic
Royal Society of Medicine • 853 views • 2 years ago

10. 

Health Emergency of Climate Change | Episode 10: What is the role of healthcare professionals?
Royal Society of Medicine • 539 views • 2 years ago

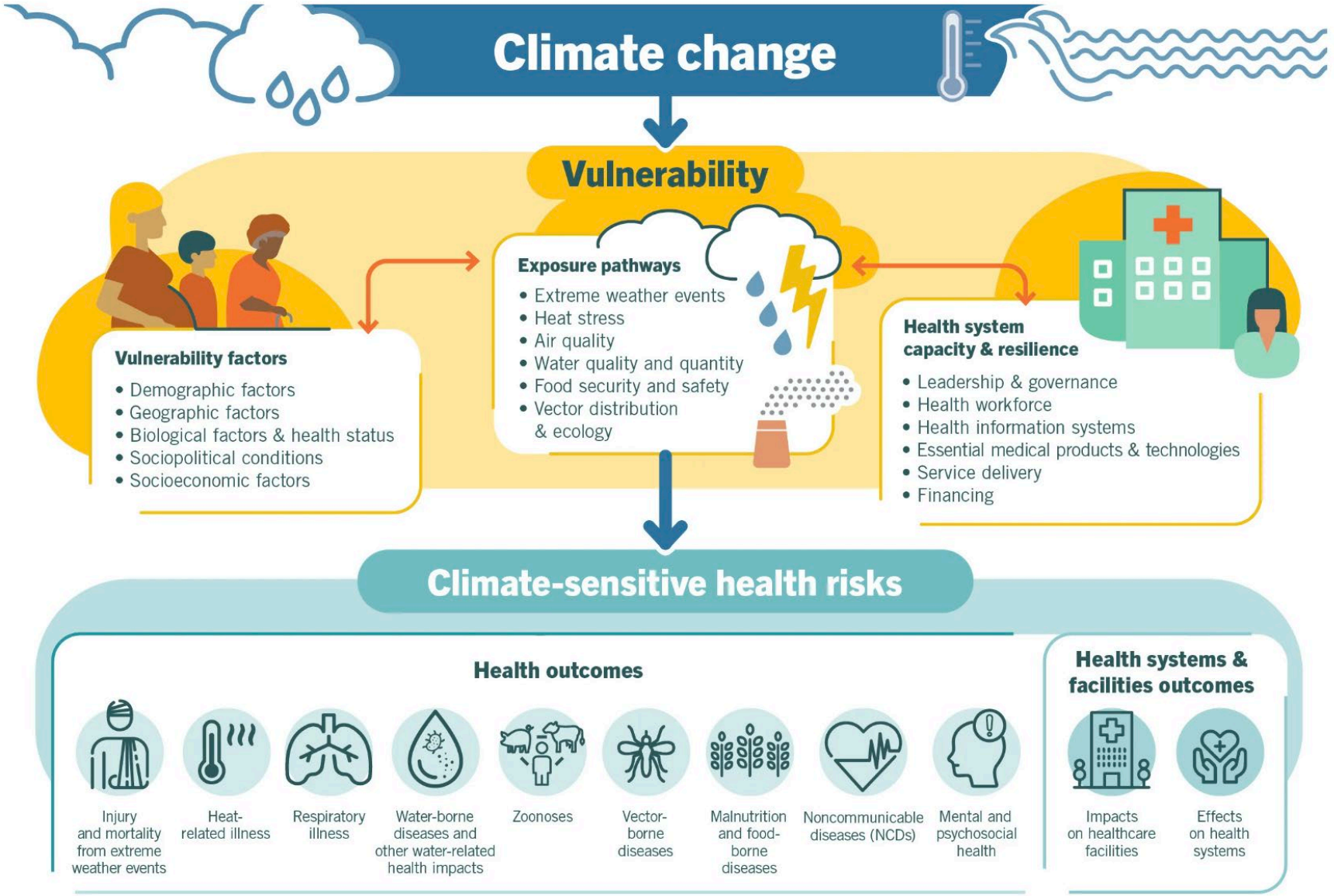


Figure: An overview of climate-sensitive health risks, their exposure pathways and vulnerability factors. Climate change impacts health both directly and indirectly, and is strongly mediated by environmental, social and public health determinants.

Topic 1: Impact of environmental & biodiversity crises on health, food security, ecosystems. Possible starting points

Impact on health

- Climate change-related hazards damage our immune systems
- Impacts of microplastics on immunity
- Thawing permafrost and immunity
- Impacts of microplastics on health
- Impact of increased water salinity on health
- Impact of increased heat on health
- Climate change impact on vector-borne diseases in Europe
- Effect of global warming and human hormones
- Climate change impact on cancer
- Effect of climate change on sleep
- Effect of climate change on mental health
- Global Warming and Violent Behaviour
- Evaluating natural medicinal resources and their exposure to global change

Impact on agriculture and ecosystems

- Climate change impacts on plant pathogens, food security and paths forward
- Climate change impacts on pollination
- Climate change impact on rice production
- Climate change impact on soil fertility
- Impact of floods /wild fire on [choose species, habitat or ecosystem]
- Impact of climate change / rising sea level / acidification /air pollution /microplastics on [choose species, country, habitat]
- Climate change disrupts ecosystem balance,
- e.g. sea urchins and kelp forest in California: purple sea urchins destroy kelp forest (lay communication but very nice) and red sea urchin threatened depending on location.
- E.g. harmful algal blooms increase

Topic 2: Environmental impact of research, healthcare sector (human/animals) and agriculture. Possible starting points

Biosciences research and healthcare impact

- Microplastics: A Real Global Threat for Environment and Food Safety
- Impacts of microplastics on health
- Environmental Impacts of Personal Protective Clothing Used to Combat COVID- 19
- Impact of polyester and cotton microfibers [labcoats components] on growth and sublethal biomarkers in juvenile mussels
- Environmental impacts of cotton (for labcoats) and opportunities for improvement
- Carbon footprint of industry-sponsored late-stage clinical trials
- Solvents and sustainable chemistry
- Life cycle considerations of solvents
- Pharmaceuticals and the environment
- Green metrics for biologics
- Understanding Traditional Chinese Medicine to strengthen conservation outcomes
- Conservation and economic benefits of medicinal plants: Insights from forest-fringe communities of Southwestern Ghana
- Conservation and sustainable use of medicinal plants: problems, progress, and prospects

Agriculture impact

- Nitrogenous fertilizers: impact on environment sustainability, mitigation strategies, and challenges
- Current status of pesticide effects on environment, human health and it's eco-friendly management as bioremediation: A comprehensive review
- Health effects of herbicides and its current removal strategies → health impact has a C footprint.
- Indirect Effects of the Herbicide Glyphosate on Plant, Animal and Human Health Through its Effects on Microbial Communities
- On the relation between monocultures and ecosystem services in the Global South: A review
- Balancing food security, vertebrate biodiversity, and healthy rice agroecosystems in Southeast Asia
- The environmental impacts of different organic rice management in Italy considering different productive scenarios
- Environmental Impacts of Commercial Shrimp Farming in Coastal Zone of Bangladesh and Approaches for Sustainable Management.
- Examining the Environmental Impacts of the Dairy and Baby Food Industries
- Sustainability of the Dairy Industry: Emissions and Mitigation Opportunities
- The impacts of soy production on multi-dimensional well-being and ecosystem services: A systematic review
- Choose some food... Or compare growing methods: organic/non organic

Topic 3: Bioindicators, biosensors, study of contributing factors, study of new environmental conditions. Possible starting points

- Field studies to monitor biodiversity
- Field studies to monitor impact of new environmental conditions (increased CO2, pH, T, salt)
- Bioindicators (living organisms, e.g. water fleas, mussels - for big picture analysis) or biosensors (analytical device –detect specific compounds) to monitor pollution or quality of air, water, and soil
- Study of man-made substances that may cause problems, e.g. determine possible toxic effects for the environment (e.g. microplastics, synthetic lawns, prescribed drugs, detergents, ...)
- Study of factors contributing to soil quality, crop/animal health to ensure food security.
- Study of factors contributing to ecosystem (e.g. mangroves) health/restoration/adaptation to ensure sustainability and limit impact on food security or health (zoonotic diseases)
- Psychology:
  - **Behaviours** driving consumption/addiction (material, social media, gen AI, or food/drink/drugs) or harming behaviours for the environment.
  - Factors influencing meaningful happiness, self-satisfaction.
- Science and society:
  - Impact of bioscience, health and ecology **education** on natality, public health and environmental policies.
  - Policy/drivers/regulations: Consequences of lack of system thinking and circularity – lack of anticipation or vigilance on unintended consequences (like in pharma industry – pharmaco-vigilance)
  - SDGs and public health free online course

Topic 4: How my discipline can contribute to solutions, mitigations or adaptations. Possible starting points

- Solutions to green research, healthcare or pharmacology (reduce, reuse, or use more sustainable resources) (e.g. Biocatalysts in pharma, green chemistry, GREENER Pharmaceuticals, drug repurposing)
- Remedy pollution (bioremediation) and ensure safe water supply (e.g. using water fleas)
- Design sustainable bio-products (e.g. biochar) or bio materials (e.g. bioplastics) fit for a circular economy
- Design ways to ensure food security with lesser impact on environment (sustainable agriculture (ruminants, rice), gene editing/selection, alternative protein sources (e.g. insects), synthetic food)
- Design nature-based solutions to restore eco-systems, capture carbon (biotechnology), protect from extreme weather events.
- Design bio-based energy (microalgae), materials or systems that help capture carbon or methane.
- Develop tools to make healthcare shift from reactive (big impact) to preventative, early intervention and more targeted treatment (biomarkers for sepsis diagnosis, drug delivery with microalgae), including social and green prescriptions, digital health tools (including VR for diagnosis or treatment, placebo/mind based techniques (e.g. hypnotherapy) to reduce pharmaceutical consumption.
- Design diagnostic and biosafety tools/treatments to restore ecosystems or reduce biodiversity loss (e.g. bovine tuberculosis and avoiding unnecessary killing of cows and badgers)
- Implement effective behavioural change approaches to promote a more sustainable life
- Importance of science communication and policy/drivers/regulation

Extra resources

ES-related student projects

How the ESPs are run:

First Semester:

- Literature review (15%)
  - 4-page essay on a specific bioscience topic linked to the ESP title/area
  - Oral presentation
- ES Training workshops (see below)

Second semester

- Project work carried out (8 weeks, 2.5 d/wk, then report)
- Data analysed and presented as a 17-page report including reflection
- Report marked and moderated (75 % of project mark)
- Project performance mark returned by supervisor (10 % of unit mark)

Training	1. Introduction to sustainability	**5. Psychological models of behavioural change**
	2, Campaigning and engaging	6. Environmental sustainability in the lab: LEAF and 6R
	3. F2F campaigning actions on campus	7. Measuring impact (C footprint, LCA, other)
	4. Circular economy	8. Conducting a project professionally, survey designs and data analysis

Type of ESP projects so far

Greening the labs

- assessing more sustainable laboratory products (less toxic or better environmental footprint),
- reducing energy consumption in labs (cold storage/incubation equipment),
- reducing plastics/consumables in labs and practicals
- Developing a calculator for estimating impact of actions in the lab
- improving the sustainability of student lab coats provision,
- increasing recycling compliance in labs

Learning tools and engagement

- Forging a path for a greenwashing and eco-influencing short module/guide
- Exchanging on the impacts of climate change and eco-actions *in my country*.
- Establishing campaigns/events to engage students and staff with sustainability, recycling and 6R on campus or in schools,

Valuing nature

- Forging a path towards more biodiverse green spaces on campus
- Exploring ways to engage students with biodiversity of campus.
- Exploring ways to increase the use of our green spaces for field studies or teaching and learning.
- Developing a guide for green prescription for practitioner and for users on campus

These projects equip students with knowledge and skills to address environmental issues; some projects help solving problems or making decisions and some help engaging students and staff.

Green ED FRAMEWORK

BRONZE	SILVER	GOLD
'GREEN GROUP' SET UP	ENGAGEMENT WITH OTHER DEPARTMENTS IN THE HOSPITAL ON SUSTAINABILITY ISSUES	JOB PLAN TIME OFFERED FOR GREENED PROJECTS
RECYCLED PAPER IN USE EXCLUSIVELY	DIGITISED PATIENT INFORMATION LEAFLETS REPLACE PRINT-OUTS	THE ED HAS GONE 'PAPERLESS'
DRY POWDER INHALERS PRESCRIBED ALONGSIDE METERED DOSE INHALERS IN LINE WITH BTS GUIDELINES	METHOXYFLURANE AVAILABLE AS AN ALTERNATIVE TO NITROUS OXIDE	NITROUS OXIDE USE IS REDUCED BY 60% COMPARED WITH BASELINE
UNNECESSARY CANNULATION REVIEWED AND REDUCTION DEMONSTRATED	THE ED HAS RATIONALISED RADIOLOGY AND PATHOLOGY INVESTIGATIONS	THE ED OPERATES A SOCIAL PRESCRIBING INITIATIVE
THE ED HAS ACCESSIBLE COMMUNICATIONS REGARDING AIR POLLUTION LEVELS AND ACTIVE TRANSPORT	STAFF CAN ACCESS SECURE CYCLE STORAGE AND CHANGING FACILITIES	TELECONSULTATION USED WHERE POSSIBLE AND NON-CLINICAL WORK CAN TAKE PLACE FROM HOME
MONITOR BRIGHTNESS REDUCED ON EVERY PC, AND TIME-TO-SLEEP SETTINGS MINIMISED	PROBLEMS WITH HEATING AND COOLING ARE EASILY REPORTED AND FOLLOWED-UP	THE ED SOURCES THE MAJORITY OF ITS ELECTRICITY FROM RENEWABLE SOURCES
BIN LAYOUT AND SIGNAGE REVIEWED AND MADE FIT FOR PURPOSE	STAFF ENGAGEMENT AND TRAINING TO IMPROVE WASTE SEGREGATION	THE ED HAS A BIODEGRADABLE WASTE STREAM ALONGSIDE CLINICAL, RECYCLING AND DOMESTIC STREAMS
THE ED HAS ELIMINATED SINGLE-USE PLASTIC CUPS AND CUTLERY	STAFF CAN USE REUSABLE PPE WHERE FEASIBLE	THE ED ADOPTS AND PROMOTES A MODEL OF SUSTAINABLE PROCUREMENT

Royal College of Emergency Medicine

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ENVIRONMENT@RCEM.AC.UK

Green ED

Royal College of Emergency Medicine

BRONZE ACTIONS



MULTI-DISCIPLINARY GREENED WORKING GROUP ESTABLISHED



SUSTAINABILITY INITIATIVES ARE PART OF STAFF INDUCTION



ED HAS ELIMINATED SINGLE-USE PLASTIC CUPS AND CUTLERY



WASTE STREAMS REVIEWED AND RECYCLING IN PLACE



COMPUTER ELECTRICITY USE MINIMISED



ED EXCLUSIVELY USES RECYCLED PAPER



EQUIPMENT AND LIGHTING OFF WHEN NOT IN USE



REMOTE WORKING SUPPORTED ON NON CLINICAL SHIFTS



RESPOND TO STAFF AND PATIENT SUGGESTIONS



ACCESSIBLE HEALTH AND SUSTAINABILITY COMMUNICATIONS



DRY POWDER INHALERS AVAILABLE IN THE ED



REDUCED CANNULATION OR VENEPUNCTURE EQUIPMENT



DISCHARGE MEDICATIONS REVIEWED TO ELIMINATE EXCESSIVE DISPENSING

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Green ED

Royal College of Emergency Medicine

SILVER ACTIONS



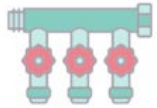
STATEMENT OF SUPPORT FROM CLINICAL LEAD



ED ENGAGES WITH OTHER DEPARTMENTS



REUSABLE SHARPS BINS ARE AVAILABLE



NITROUS MANIFOLDS REVIEWED



PATHWAYS TO RETURN LOANED EQUIPMENT



REUSABLE PPE USED WHERE POSSIBLE



METHOXYFLURANE IS AVAILABLE IN THE ED



NO IDLING POLICY FOR VEHICLES OUTSIDE ED



ACTIVE TRANSPORT IS SUPPORTED



UNNECESSARY TESTING IS REDUCED



ENTONOX USE IS REDUCED BY 30%



DIGITAL LEAFLETS ARE AVAILABLE



PATHWAYS FOR RAISING PROBLEMS WITH ESTATES



REDUCED TWO PIECES OF EQUIPMENT

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Green ED

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GOLD ACTIONS



TIME IN JOB PLAN FOR GREEN ED



MITIGATION AND ADAPTATION PLAN IN PLACE



REGULAR COMMUNICATIONS WITH ED STAFF



SUSTAINABLE PROCUREMENT MODELS



BIODEGRADABLE WASTE STREAM IN PLACE



CLINICAL EQUIPMENT IS REUSED OR RECYCLED



REDUCTION IN NON STERILE GLOVE USE



TELECONSULTATIONS AND HOME WORKING ARE SUPPORTED



SOCIAL PRESCRIBING INITIATIVES IN PLACE



ENTONOX USE IS REDUCED BY 60%



THE ED IS PAPER FREE



EXISTING PROCEDURE PACKS REVIEWED



ELECTRICITY FROM RENEWABLE SOURCES



REDUCED THREE PIECES OF EQUIPMENT

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Extra resources

Greening our labs

Tips to Reduce plastics in labs

SCAN ME

Full approach

6R full guide

Review your protocol/practical with 6R

Review

- **Procurement**. Use sustainable products or suppliers, negotiate the purchase of kit components separately, and packaging options.
- **Take stock and share**: only order what is needed.
- **Protocol**. Are all steps needed? Could a new protocol be more sustainable?
- **Layout**. Optimise sharing of material, reduce waste opportunities, optimise recycling.

Reduce Replace

- Can you create reagents/kits in house?
- Can you use products or equipment that reduce plastic?
- Can you downsize plastic containers?
- Do you need all these samples, dilutions, gloves?
- Could more be shared between classes/labs?
- Consider replacing with alternatives (paper, wood, glass), but check sustainability.

Reuse Refill

- Consider reusing gloves, tips, tubes, cuvettes, pipettes, weighing boats and refilling containers.
- Can you rinse or wash between uses? Could someone else reuse it?
- Consider in house protocol/equipment to decontaminate, wash, sterilise.
- Could you repurpose it?

Recycle

- Packaging: Do we recycle it? If not, can it be sent back? Benefits from bulk buying?
- Are you following the guidelines for management of contaminated/non contaminated plastic?
- Could you recycle more with more organisation?

Other Universities are setting decontamination protocols to reuse or recycle. We are exploring this.

18 practicals reviewed.

Savings per year

- **65,500 plastic items**
- **£4200**

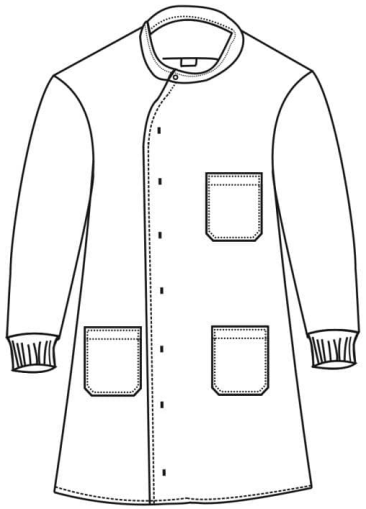
Training for reviewers (staff, GTA, trained student) available here. Developing an impact calculator.

Also consider reducing Energy, water, reagents or using more sustainable reagents

THE LABORATORY EFFICIENCY ASSESSMENT FRAMEWORK

LEAF







Robert Musgrave
(22-23)
BSc Biology

Student project = Review environmental impact of our labcoat provision.

65% polyester (plastic) and 35% cotton

ACTION: Collect after last practical and launder

Current: 900 NEW labcoats /yr

- 63 kg of pesticide/herbicides
- Loss of biodiversity on land and in water
- 4500 kg CO_2 eq
- 18,000,000 L of water (most waste water polluted)
- **Impact = almost entirely raw material and manufacturing**

BENEFITS of REUSING:

63 kg of pesticides + no loss of biodiversity on land and in water

3600 kg CO_2 eq: Driving a car half way around the equator (20690 km)

18 million L of water >7 Olympic pools

Legacy: A student will implement and evaluate. Should save £10K and create GTA jobs.