Are We There Yet?

Climate Change and Health in Medical Education

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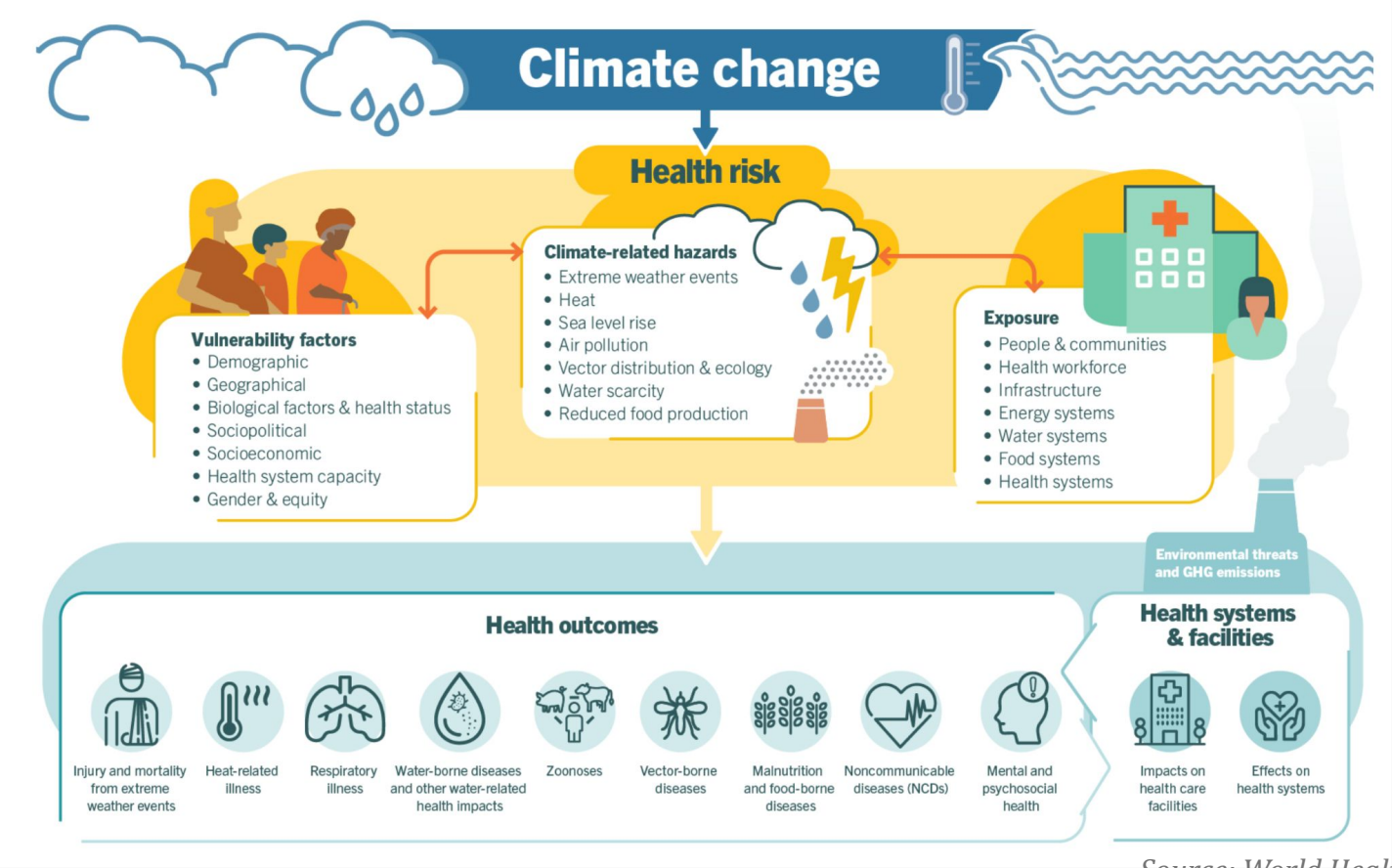
Agenda

- Why planetary health in medical education?
- The Planetary Health Report Card
- Optimal UME and exemplars
- Resources
- Optimal GME and exemplars
- Gaps and opportunities
- Q&A

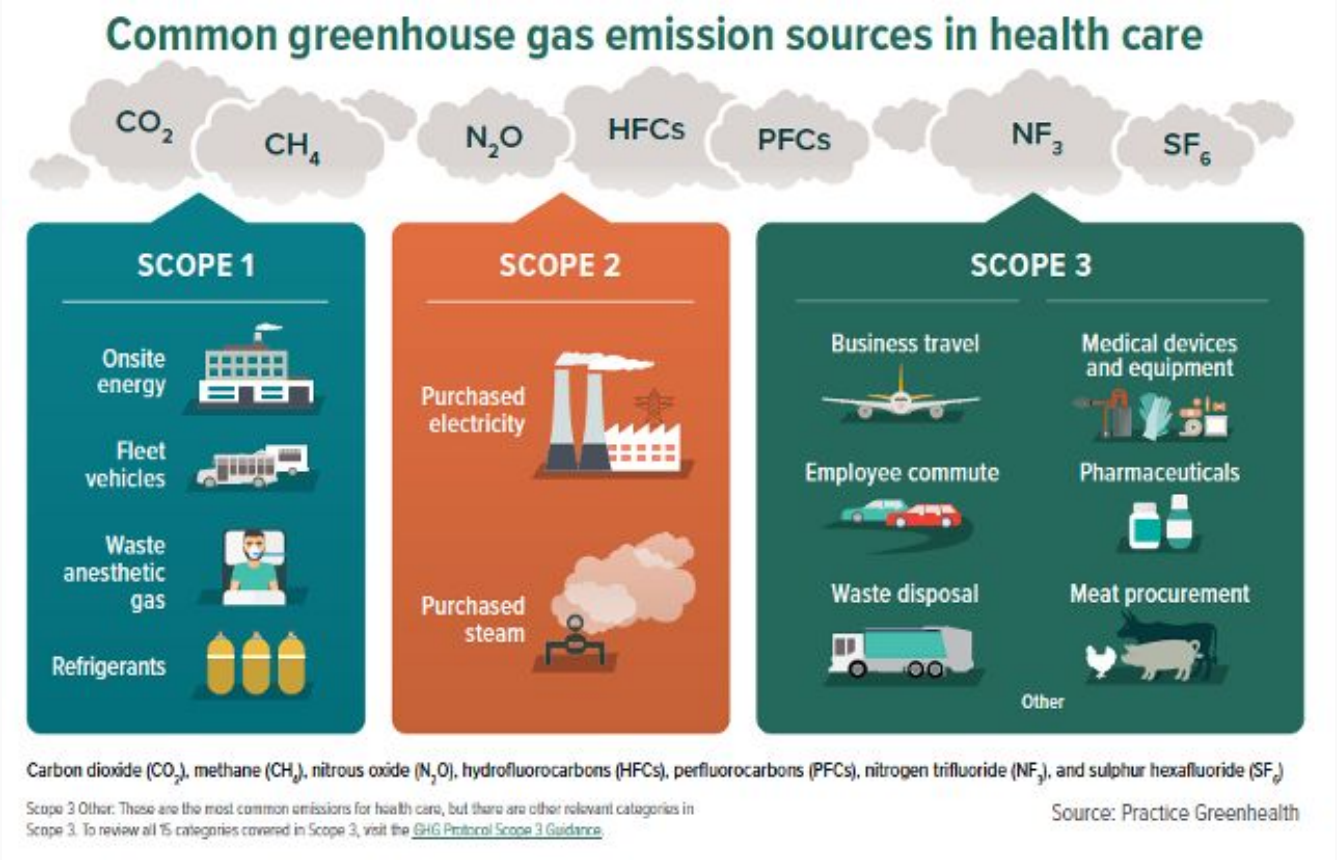
A Tale of Two Cities

Climate change and health impacts



Source: World Health Organization

Healthcare's impact on climate change



The Gap: Trainee Education

- Per AAMC, 55% of medical schools with some climate education (2021-2022)
- Survey of 600 medical students in 2021
  - 84% believed that climate-health needed in curriculum
  - 13% believed that their medical school was providing adequate education
  - 6% felt “very prepared” to discuss climate change and health with a patient

Figure 15: Degree of Trust in Sources of Health Impacts of Climate Change.[70]

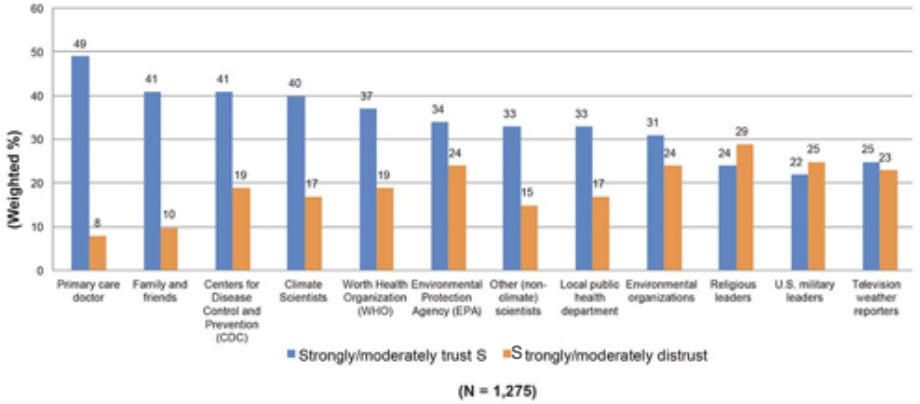


Figure Source: Recreated from Maibach EW et al, 2018.

Barriers

- Limited curricular time
- Lack of faculty content expertise
- Evolving curricular standards
- Not covered in national assessments (e.g. USMLE)
- Perceived as political

What does optimal planetary health UME look like?

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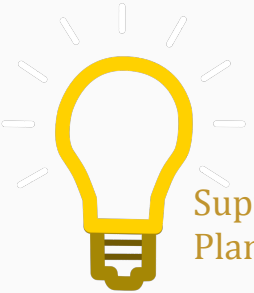
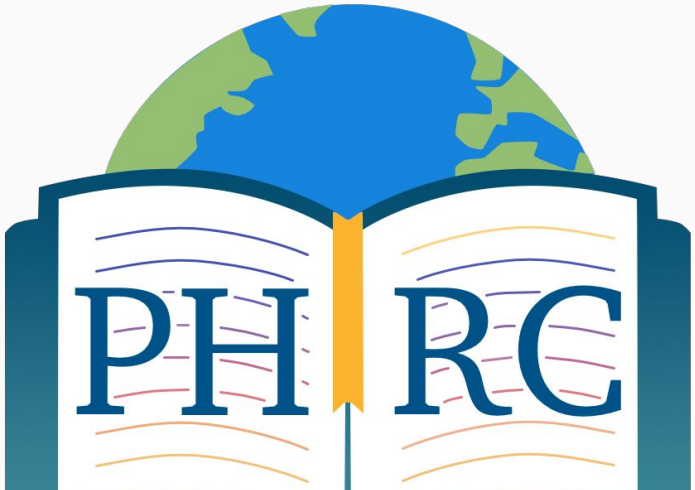
Community Outreach and Advocacy

Interdisciplinary Research in Health and the Environment



Support for Student-Led Planetary Health Initiatives

Curriculum



Campus Sustainability

What does optimal planetary health UME look like?

Community Outreach and Advocacy

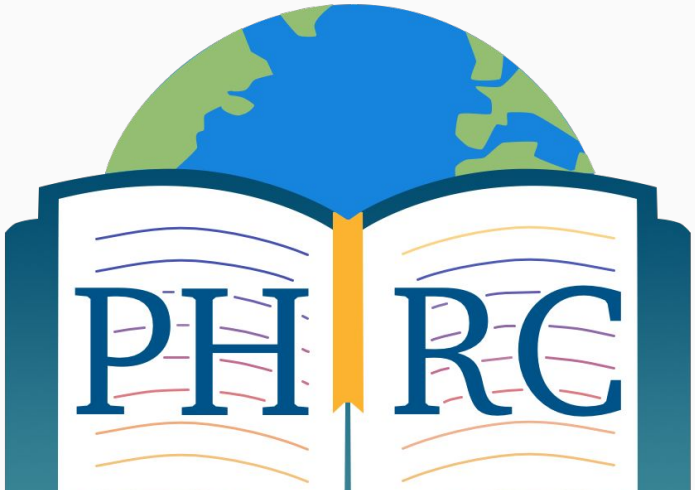
E.g. Does your institution partner with community organisations to promote planetary and health?

Interdisciplinary Research in Health and the Environment

E.g. Is there a dedicated department or institute for interdisciplinary planetary health research at your institution?

Support for Student-Led Planetary Health Initiatives

E.g. Does your institution offer support for students interested in enacting a sustainability initiative/QI project?



Curriculum

E.g. Does your medical school employ a member of faculty to specifically oversee and take responsibility for the incorporation of planetary health and sustainable healthcare as a theme throughout the course?

Campus Sustainability

E.g. Do buildings/infrastructure used by the institution for teaching (not including the hospital) utilize renewable energy?

PHRC Results

Want to see how your school did on our metrics and learn why? Find your school-specific report card by selecting the nation in which the school is located. We are hopeful that this report card will help inspire institutional change, at a time where institutional engagement with planetary health is urgently needed.

MEDICINE		NURSING
PHARMACY		DENTISTRY
PHYSIOTHERAPY	OCCUPATIONAL THERAPY	VETERINARY
NUTRITION AND DIETETICS	HEALTHCARE MANAGEMENT	AUDIOLOGY

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PLANETARY HEALTH REPORT CA

2024-2025 INTERNATIONAL SUMMAR

Healthcare students and faculty from 188 health

CONTENTS

2025 PLANETARY HEALTH REPORT CARD
MEDICINE

UNITED STATES

(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
1.	UC Berkeley - UCSF Joint Medical Programme	A-	B	A+	A	A-	B+
2.	Emory University School of Medicine	A	A+	A+	A	A+	B
3.	University California San Francisco	A-	A-	A+	A	A	B
4.	University of Connecticut	A-	A	A+	B	A-	B+
5.	University California San Diego	A-	B+	A	A+	B	A
6.	University of Minnesota	A-	A	A	B	A	C+
7.	University of Pennsylvania	B+	B	A	A	A	B-
8.	University of Wisconsin School of Medicine and Public Health	B+	B	A+	A	A	C
9.	University of Colorado School of Medicine	B+	B	A	A+	B	C+
10.	Cooper Rowan University	B+	B	A	B	A	C+
11.	University of Pittsburgh	B+	B-	A	C+	A+	B
12.	The Ohio State University	B+	C	A	A	A	B-
13.	Hackensack Meridian School of Medicine	B	A-	C+	A	A-	C
14.	Harvard Medical School	B	B	B+	B	A	B

80-100% = A, 60-79% = B, 40-59% = C, 20-39% = D, 0-19% = F

Scores within top or bottom 5% awarded + or -, respectively

= Overall score improved from 2023-2024 to 2024-2025

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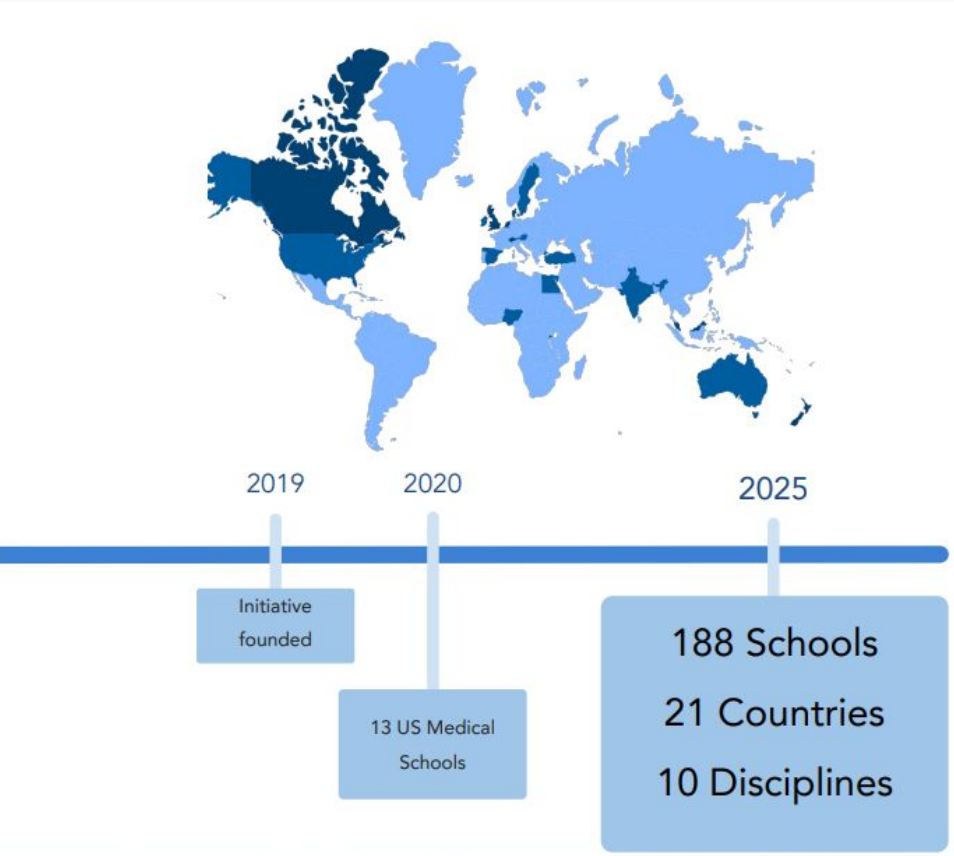
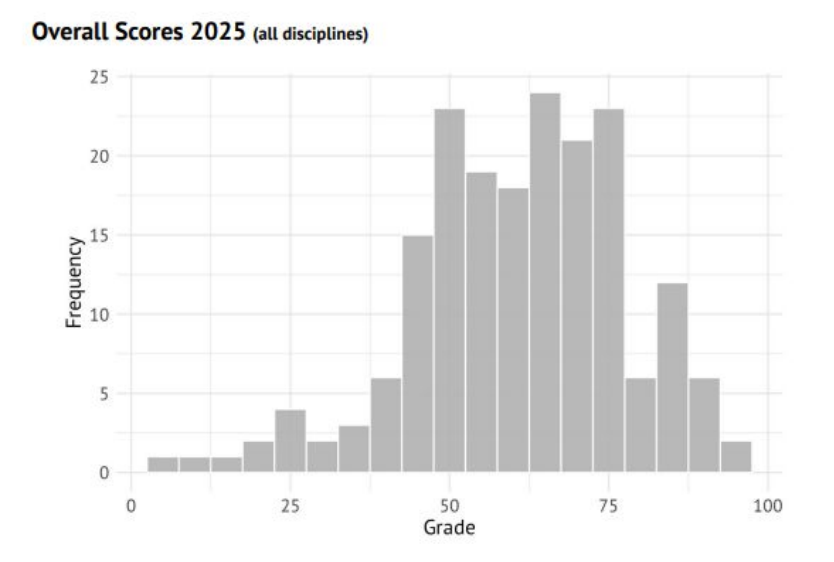
Growth over time

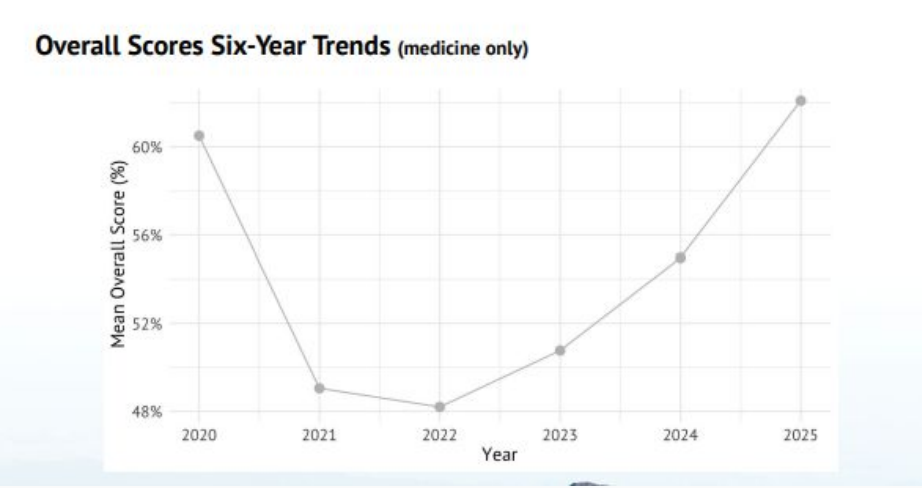


- 2025 Professions:
  - Medicine, Pharmacy, Nursing, Occupational Therapy, Dentistry, Physiotherapy, Veterinary, Nutrition, Healthcare Management, Audiology
- 2025 Countries:
  - Australia, Austria, Canada, Denmark, Germany, India, Ireland, Malaysia, Netherlands, Nigeria, Portugal, Rwanda, South Africa, Sweden, Switzerland, Türkiye, Thailand, United Kingdom, United States

Improvement over time

- Idea sharing
- Student-faculty collaboration
- Peer benchmarking & public accountability





What does optimal planetary health UME look like?

- **Integrated**
- Multimodal
- Student and faculty input
- Relevant to clinical practice
- Addresses the following:
  - Impact on climate change on health
  - Impact of healthcare on climate change
  - Equity

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Table 1. Description of course-specific Climate Change, Environment, and Health curricular (CCEH) theme integrations in the pre-clerkship curriculum.

Course	Course Description	CCEH Integration: Content	CCEH Integration: Format	CCEH Competency (See Table 2)
Introduction to the Profession	An orientation for first-year medical and dental students to teach professionalism expectations as physicians in training	Advocacy and activism through a climate lens	Lecture, facilitated small-group breakout session	1,2,3,5
Foundations	Integrated basic science course focusing on multiple disciplines, including molecular biology, biochemistry, pharmacology, histology, anatomy, immunology, genetics, and microbiology	Land use change and malaria	Integrated additions to the preparatory reading and in-class clinical vignette as part of case-based learning	1,2,3
Immunology in Defense and Disease	Foundational course focused on dermatology rheumatology, allergy, and immunology	Allergic rhinitis and climate change	Integrated additions to the preparatory materials and existing clinical vignette	1,2
Practice of Medicine	Longitudinal clinical skills course, focused on history-taking, physical exam, clinical reasoning, and primary care	Exposure history and heat risk screening questionnaire	Preparatory materials to be reviewed with preceptor during clinic	1,2
Essentials 1	Integrated social sciences course focusing on clinical epidemiology, health policy, social medicine, and medical ethics	Environmental justice and global climate justice	Integrations into small group discussion materials, two optional talks on climate policy and environmental justice	3,4,5
Homeostasis 1	Physiology and pathophysiology course covering pulmonology, cardiology and hematology	Air pollution, asthma, and CAD*	Preparatory concept video, assessment question, consolidation exercise, expansion of existing clinical vignette	1,2,3
Homeostasis 2	Physiology and pathophysiology course covering nephrology, gastroenterology, and endocrinology	Climate change, dehydration, and MeN**/CKDu***	Assessment question and consolidation exercise	1,2
Mind, Brain, and Behavior	Physiology and pathophysiology course covering neurology and psychiatry	Climate change, and mental health	Preparatory video, assessment question	1,2
Transition to the Principle Clinical Experience	A preparatory course for students entering the core clinical clerkships	Healthcare sustainability focused on surgical waste, heat stress among the elderly, air pollution and environmental impacts on cardiovascular disease	Integrations into case-based sessions and small group discussions	1,2,3,4,5

Harvard Medical School, as published in Plos Climate 2024

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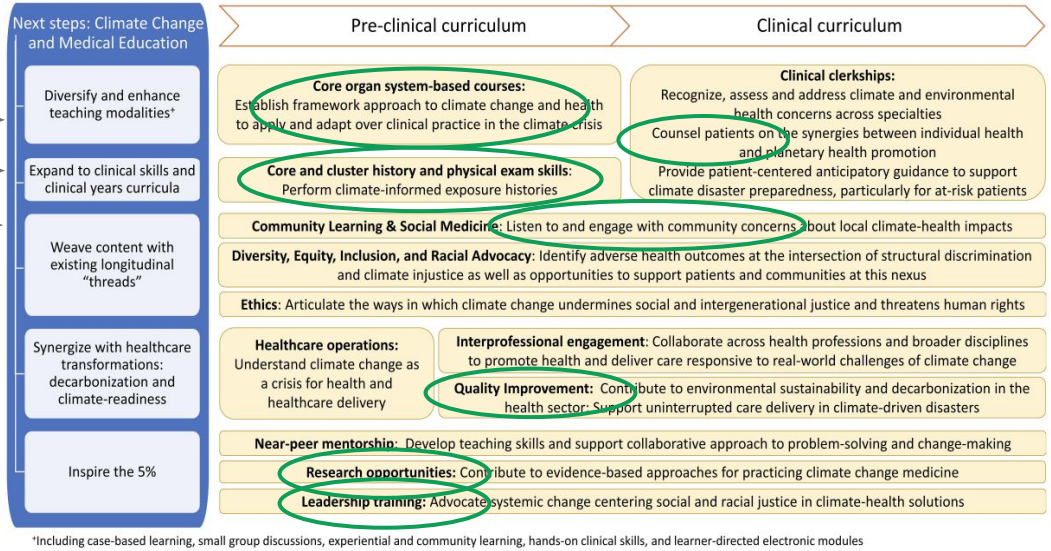


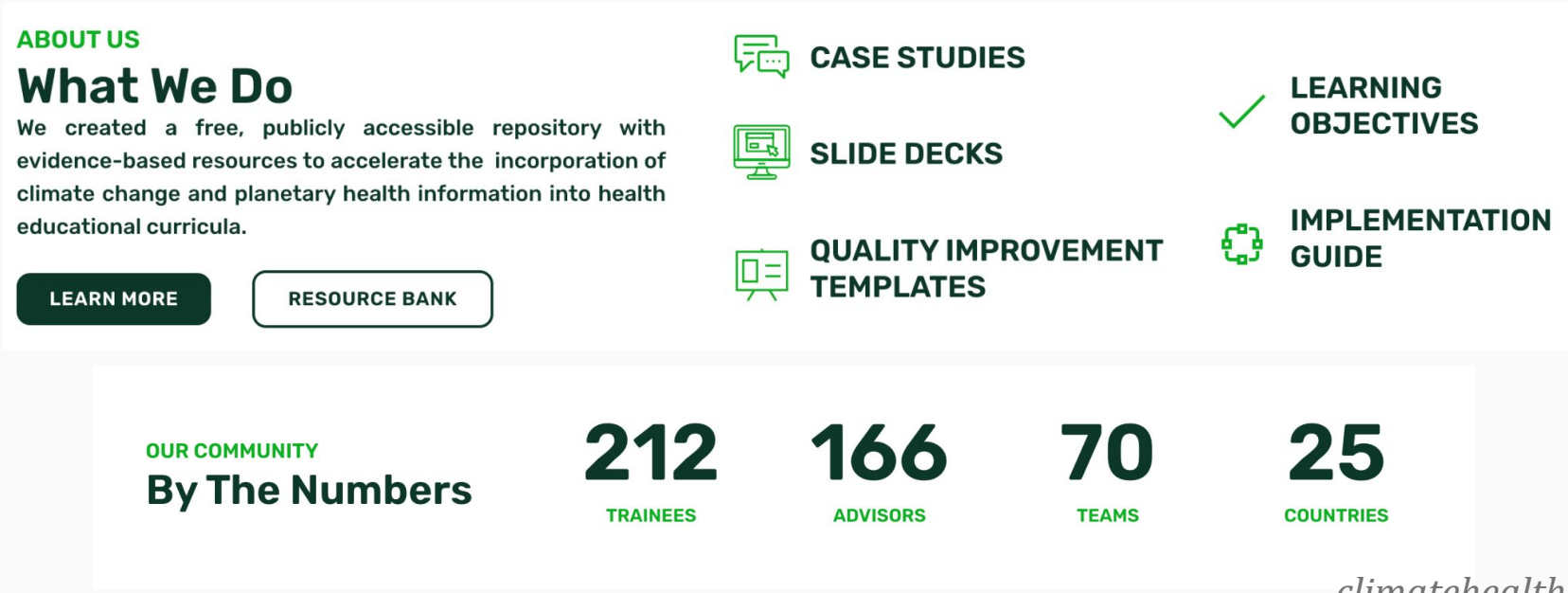
FIGURE 2
Climate change and environmental health in medical education: Curricular opportunities and learner outcomes informed by student perspectives. +including case-based learning, small group discussions, experiential and community learning, hands-on clinical skills, and learner-directed electronic modules.

Emory Medical School, as published in Frontiers in Public Health 2022

Resources: Global Consortium on Climate and Health Education

- Core Competencies
- Courses
- Working Groups
- Resource Banks

Resources: Climate Resources for Health Education



climatehealthed.org

Coming soon PHRC for GME

In summary

- **Climate is a health issue**– medical education should embed it at every level of training
- **Best practices**: integrate across curricula, use case-based learning, and foster student-faculty collaboration
- **Resources and networks**: abundant and ready, no need to reinvent the wheel

Climate Education: Find your Why…

Climate Education: The State of Play in GME

- Work hours for GME programs are capped at 80 hours per week averaged over a 4 week period.

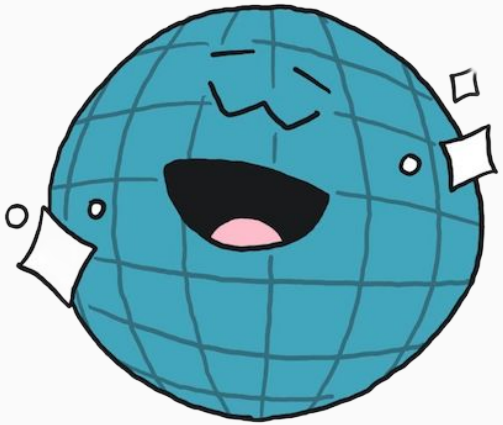
But…

- There are rules for adequate rest:
  - 24-hour limit on continuous duty
  - Can extend by 6 hours for patient care
  - Or education (I personally do my best learning at this time)
  - One day off per week - averaged over four weeks

Climate Education: The State of Play in GME

On top of these work hours, residents need to:

- Participate in research projects
- Build a CV for fellowship applications
- Conduct a quality improvement project
- Study and complete Step 3
- Take In Training Examinations each year
- Prepare for board exams on completion of residency
- Participate in weekly didactics
- Present at didactics
- Present at M&M meetings



Climate Education: The State of Play in GME

What do we know about Climate Change and Health?

- Climate change is REAL and happening now
- It affects the health of humans who are attending our departments
  - Direct effects of heat, aeroallergens, pollution on many bodily systems
- It affects our ability to care for patients
  - Interruptions to transport both of patients and staff
  - Loss of, power
  - Surges and lack of services in the event of disasters
- US Healthcare sector itself is a huge emitter
  - If it were a country it would be in the top 15 of global emitters
  - Is it sustainable?

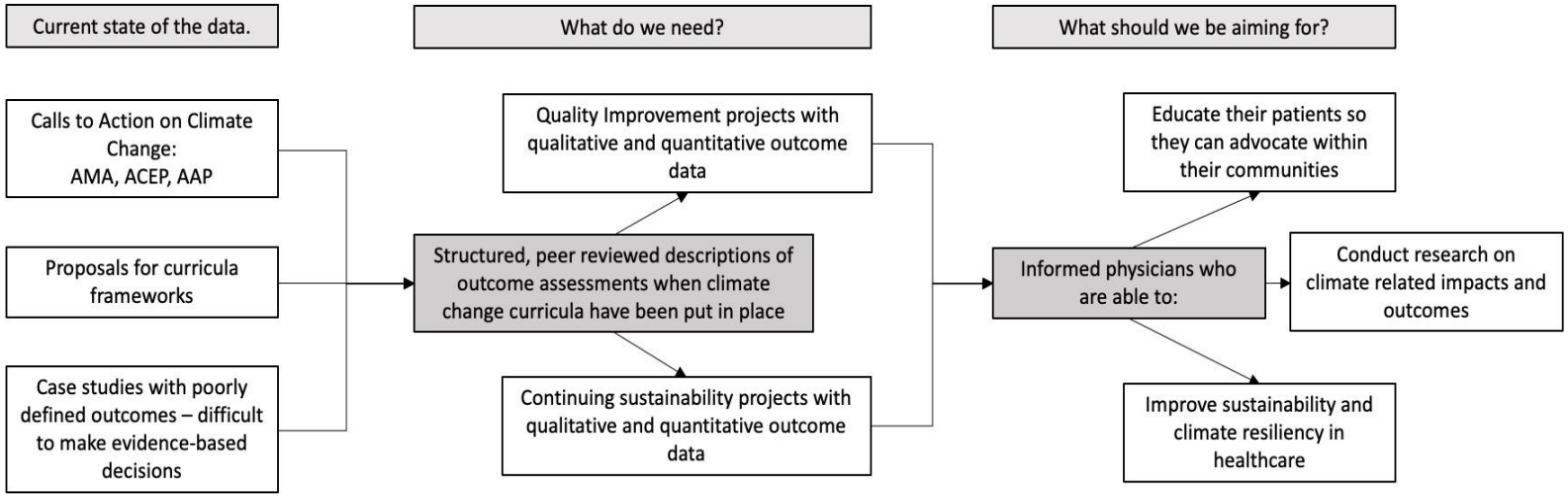
Climate Education: Deficit -v- Asset based Framing

So…

- I’m glad we agree, it’s pretty damn important.
- But where and how do we fit it into our programs?

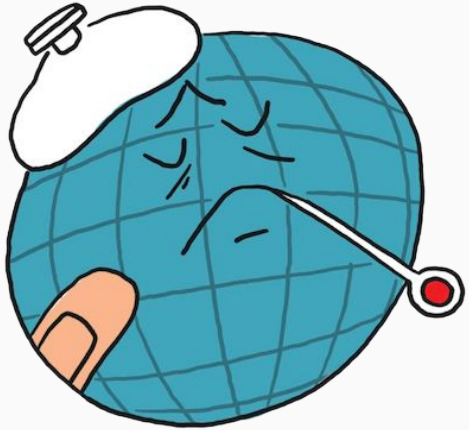
- We need to be careful that we are not re-inventing the wheel
- What is already out there? How can we leverage that cumulative knowledge?

Climate Education: The State of Play in GME



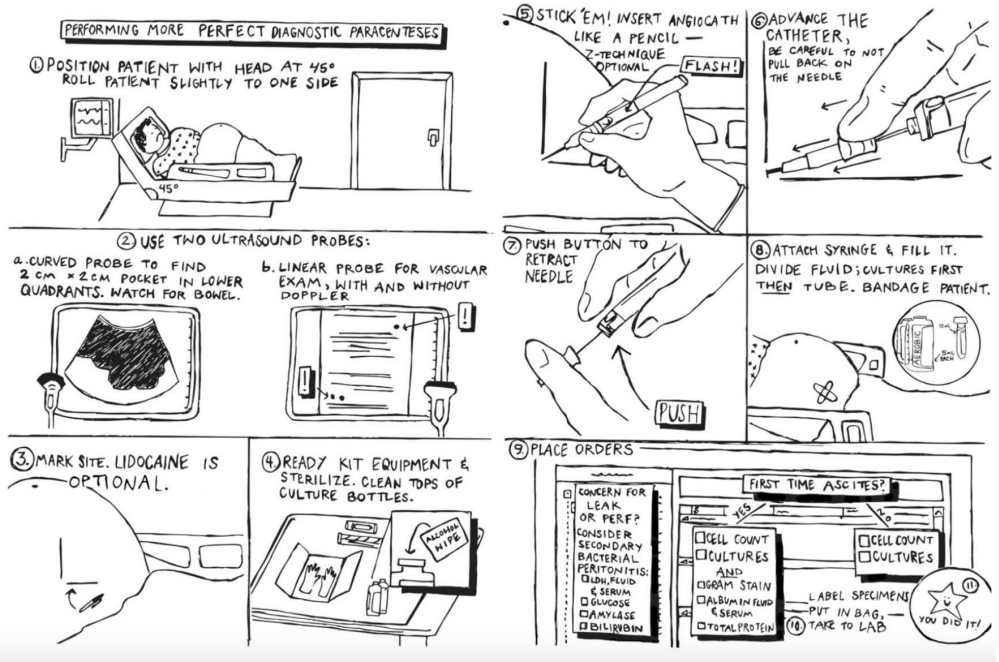
Climate Education: Some Notable Curricula

- Colbert - transdisciplinary fashion to improve hospital-wide sustainability
- Kuczmarski - novel framework following an organ system approach to be more easily incorporated into the existing internal medicine curriculum
    - Also employed a train the trainer model
- Philipsborn - outlines the topics that programs should include in climate curricula
- ALiEM - Climate Change Curriculum (aliem.com)



Climate Education: QI Lens - But make it stick!

- Gottesman et al
- Novel diagnostic paracentesis kit
- Saved $95 per kit
- Save disposal of 16 out of 29 items from generic kit



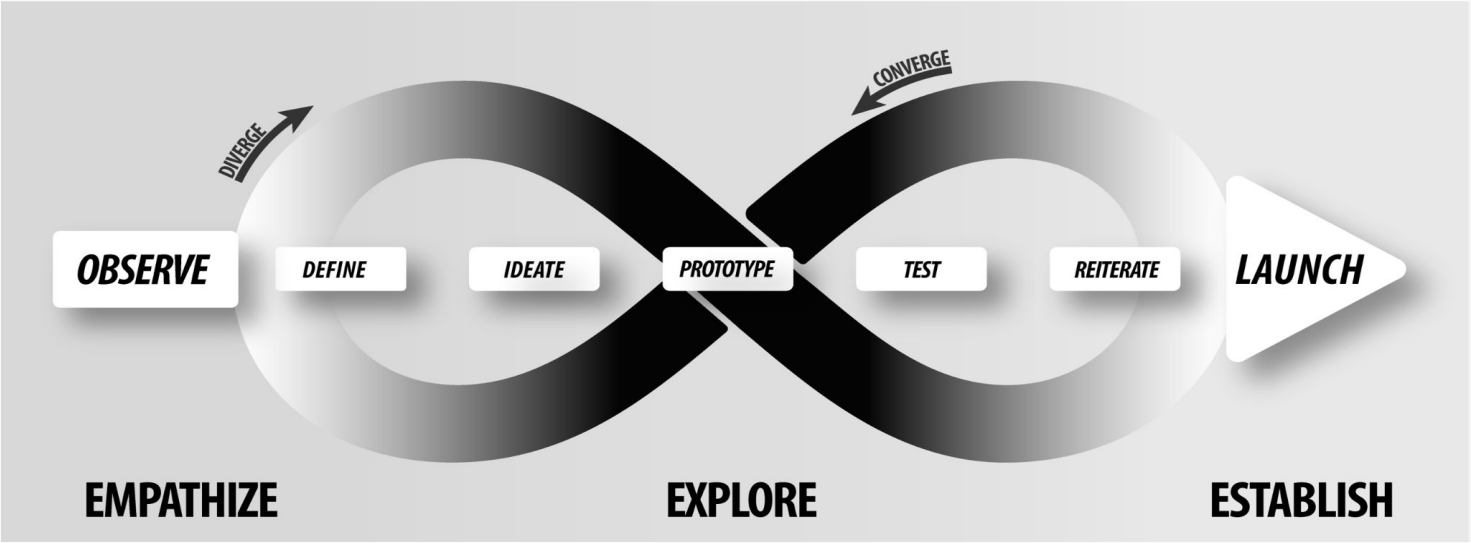
Climate Education: QI Lens - But make it stick!

- Vacharathit et al
- Generational QI project
- “Greening the operating room” - over the course of a 5 year fellowship program
- Aligning with institutional goals

Water Waste Reduction	20% reduction 116,865 gallons of water saved
Medical Waste Reduction	1 million pounds of plastics diverted from landfills
Electrical Energy Usage	9hrs ceiling lights off per day $53,075 savings per year Reduction of 717 mT of CO_2 yearly

Climate Education: Human - What?

- Human Centered Design
- Set of tools
- A mindset shift
- Focus on the end-user
- Values empathy
- Dynamic, designed to prototype and fail



Climate Education: Preparedness

- Experience with Hurricane Harvey
  - Transportation
  - Resources
  - Team structures

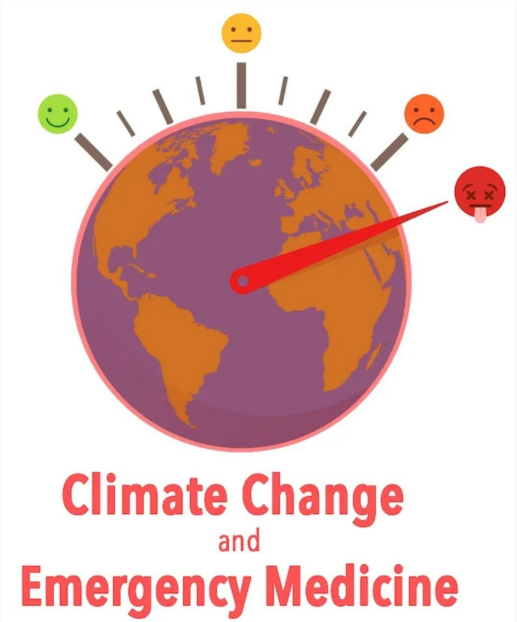
Climate Education: Language Matters

Segment most prevalent locally	Typical stance	What resonates	What backfires
Dismissive (≈ 10–15 % in Crook/Jefferson)	"Hoax."	Extreme-weather preparedness they already practice (fire-wise, heat safety).	The phrase **"climate change."**
Concerned/Alarmed (≈ 35 %, concentrated in Bend)	"It's serious, let's act."	Community-wide solutions, policy advocacy.	Over-simplified talking points.
Cautious (≈ 25 %)	"Maybe it's real, but not urgent."	Concrete health & cost frames ("ER visits spike on smoke days").	Doom-laden global narratives.
Doubtful (≈ 20 %)	"Natural cycle, not my problem."	Self-reliance & stewardship ("defensible space keeps your ranch safe").	Moralizing about carbon footprints.

Source: YPCCC Six Americas national survey, mapped to county voting and opinion data.

Climate Education: Future scholarly opportunities

- For those of you who are research oriented:
  - What are the opportunities?



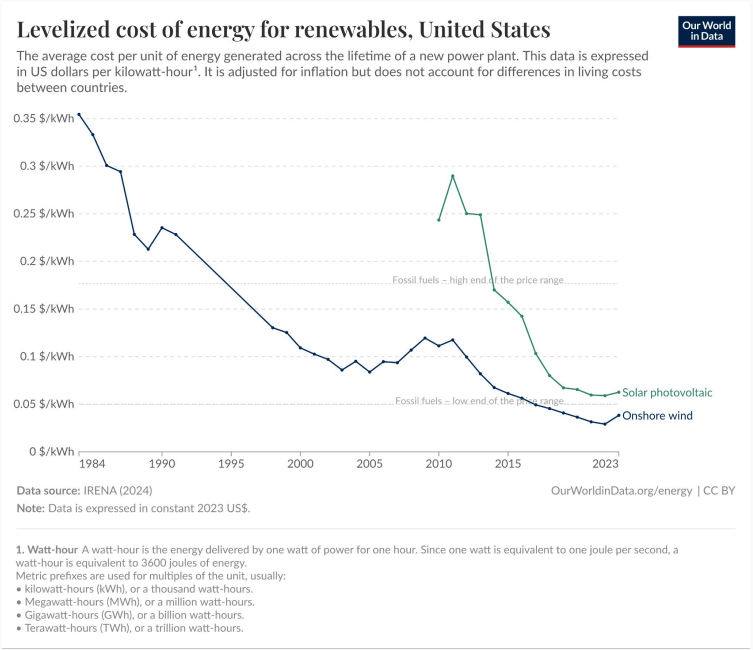
Climate Education: Let's Get Fired Up!!

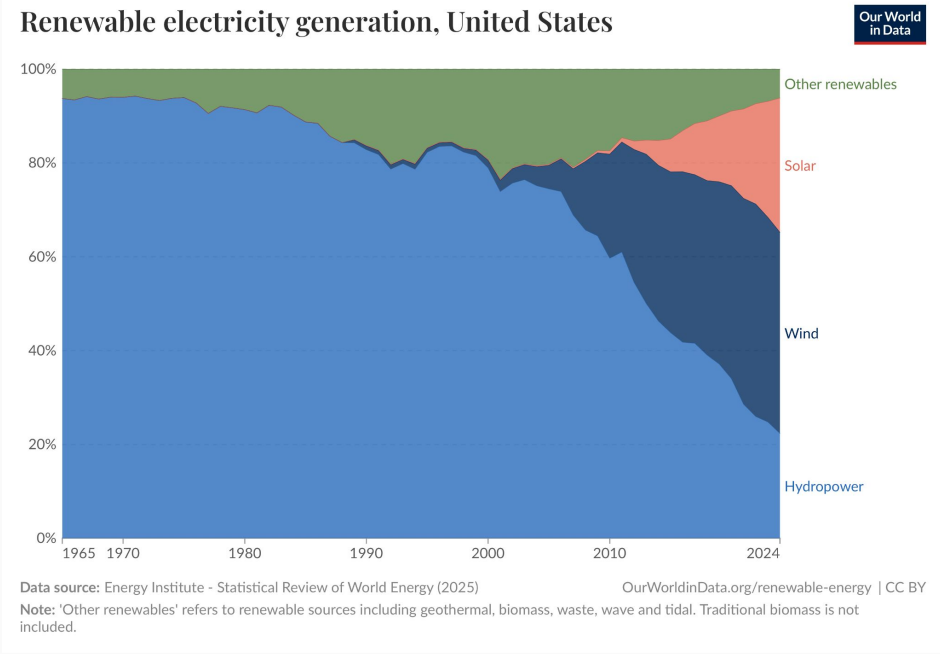
This is what we are up against…

- EO in April 2025 - "Protecting American Energy from State Overreach"
- Resulted in removal:
  - Climate change page on White House website
  - Climate & sustainability section of DOT website
  - Climate change from State Department website
  - Climate Portal of DOD website

economic and national security. New York, for example, enacted a "climate change" extortion law that seeks to retroactively impose billions in fines (erroneously labelled "compensatory payments") on traditional energy producers for their purported past contributions to greenhouse gas emissions not only in New York but also anywhere in the United States and the world. Vermont similarly extorts energy producers for alleged past contributions to greenhouse gas emissions anywhere in the United States or the globe.

Climate Education: Let's Get Fired Up!!



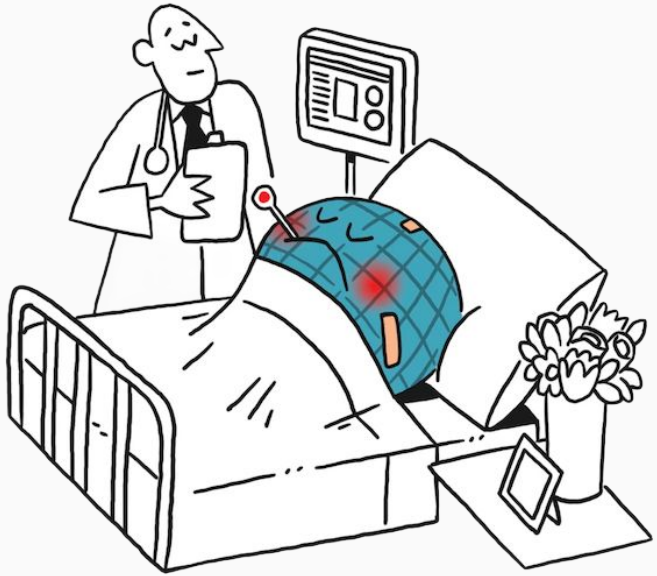


Climate Education: Let's Get Fired Up!!

Summary

Three opportunities for curriculum development:

1. Longitudinal comprehensive curriculum best deployed within a special interest track system
2. “One Slide” Campaign deploying a teach the teacher model used during didactic curriculum - best to capture ALL learners
3. Healthcare sustainability through the Quality Improvement lens



Questions?