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Clinician engineers—the time is now

I read with great interest the Perspective by Roger Kneebone and Claudia Schlegel,[1] and I agree about the pigeon-holed approach to medical education.[1] COVID-19 has shown clinicians and engineers working side by side to ensure health-care worker safety via personal protective equipment and the management of patients through ventilators.

Engineering platforms are used to diagnose and treat patients. Clinicians use the endoscope, the CT scan, dialysis machines, cardiac stents, etc, yet have little understanding about how these devices are made or work.

The Clinician Engineer Hub is a global network aimed at bridging the gap between medicine and engineering. The hub offers workshops, research opportunities, and industry-based opportunities for medical students, and early career doctors to ensure they are given the chance to gain knowledge and skills in engineering. Students within the network are empowered to serve as leaders. To date, we have held summer and winter schools, multiple webinars, a 3-day conference, and offered collaborations with researchers in laboratories or through industry internships. Webinars have included topics such as biomechanics, optics, coding, and aerospace engineering. Our conference featuring academic experts globally and industry members—from Google Health, Microsoft, and Amazon Web Services as well as WHO—gained considerable interest (20 million impressions via Twitter).

For the **Clinician Engineer Hub** see https://clinicianengineer.com

Later this year, we will be holding a virtual hackathon—ClinHacks—aimed at innovative engineering solutions to health care.

For more on **ClinHacks** see https://clinhacks.org

As Kneebone and Schlegel highlight, medical education is typically funnel based and I fully endorse the need for “funnel perforation”.[1]

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[1] Kneebone R, Schlegel C. Thinking across disciplinary boundaries in a time of crisis. *Lancet* 2021; **397:** 89–90.

Long-haul COVID: heed the lessons from other infection-triggered illnesses


Steve Parsons/Getty Images

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For the **Johns Hopkins Coronavirus Resource Center** see https://coronavirus.jhu.edu/

According to the Johns Hopkins Coronavirus Resource Center, more than 115 million people worldwide have been infected with SARS-CoV-2 during the COVID-19 pandemic, with extensive implications for morbidity and mortality. Description of long-term effects of COVID-19 are appearing in the medical literature; the first large cohort study[1] with 6-months’ follow-up has been published, and more data are sure to follow. A small number of studies point not only to persistent imaging and testing abnormalities across several organ systems in the postacute period, but to a high frequency of patient-reported symptoms such as fatigue, insomnia, anxiety and depression, autonomic disturbances, cognitive difficulties, pain, and others. The presence of patient support groups, and the rapid expansion of clinics to manage or treat these symptoms, validate further their existence and impact.

Although the frequency, severity, and potentially the etiology of persistent symptoms can vary, sequelae after COVID-19 appears poised to join the range of other postinfectious syndromes described in the field of infectious diseases.[2] These often share a common symptom phenotype, which might also meet case definitions for myalgic encephalomyelitis/chronic fatigue syndrome, fibromyalgia, or post-treatment Lyme disease. We hope that researchers and clinicians will draw on these other conditions as they continue to advance scientific understanding of so-called long-haul or persistent COVID-19. We would also argue that there are important lessons to learn and pitfalls to avoid; our specific area of clinical care and research (post-treatment Lyme disease) has remained a fiercely contentious condition for more than 30 years.[3]

To quantify severity and measure improvements are inherently easier in objective abnormalities than in patient-reported symptoms. Furthermore, a scientific knowledge gap surrounds the cause of persistent symptoms after acute infections, such as fatigue. Both factors contribute to the risk of dismissing patient-reported complaints, particularly those that might appear vague, difficult to explain, multifactorial, or unexpected. Although peer-reviewed research is needed, patients with persistent symptoms after COVID-19 are already facing illness invalidation and disbelief from health-care providers, family, and friends.[4] In listening to patients, the resolution of objective abnormalities is often not the whole story of their illness, and symptoms such as fatigue could instead be the most devastating to patients' quality of life. Postinfectious syndromes, including persistent symptoms after COVID-19, present a considerable challenge to clinicians and researchers. However, they also present the opportunity for novel, scientifically rigorous, inclusive, open-minded research with the aim of helping patients with these poorly understood conditions recover their health.

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For **Decolonising the Medical Curriculum** see https://decolonisingthemedicalcurriculum.wordpress.com/

Accountability framework to decolonise global health

Lioba Hirsch[1] reinforces the widespread displeasure towards the continued lack of equality, diversity, and inclusion (EDI) in global health. Although global health might have indeed evolved into "an instrument for a new era of scientific, programmatic, and policy imperialism",[2] by design or default, several researchers and institutions in low-income regions have indisputably enjoyed and continue to benefit from purposeful collaboration with colleagues in high-income regions.[3]

However, simply highlighting dimensions and manifestations of EDI in scholarly journals and the numerous pledges for institutional reform might be insufficient in dismantling this monstrous social epidemic. Mechanisms for internal and external accountability are necessary in global health institutions, such as those described by WHO,[4] to tackle systemic racism head-on and ensure that individuals that exhibit provable racism in any form are held to account for their actions. If there are no consequences for violating societal norms and commitments in any capacity, progress towards compliance will remain elusive.

The principal actors and victims of racism tend to attract most attention. But collaborators and facilitators including funders ought to be held equally accountable. Additionally, to be effective, the envisioned accountability framework should be representative, independently governed, minimally bureaucratic, trustworthy, and readily accessible to all without fear of reprisal.

The long-term impact of these equity-driven mechanisms might be complicated by politics,[5] but we can draw inspiration from the words of J F Kennedy—that just because we cannot see clearly the end of the road, that is no reason for not setting out on the essential journey.

I declare no competing interests.

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Transformational learning to decolonise global health

We thank Lioba Hirsch[1] for her incisive Art of Medicine on efforts to decolonise global health institutions and the exigency of moving beyond tokenistic initiatives and showy commitments to diversity. The flattening of entrenched colonial era power hierarchies is essential to ensure policy, education, and research is informed by perspectives from the very communities they affect. Yet these hierarchies are propped up by historical biases that formed, and remain deeply embedded in the very structures of our institutions.[2] To invoke a conceptual framework for decolonisation through top-down initiatives is tempting, but such taxonomies should arise from paying attention to the narratives of people who suffer from the prejudices that have arisen through colonial regimes. As the University College London's Decolonising the Medical Curriculum reiterates, these prejudices are not limited to racism but also classism, sexism, ableism, xenophobia, and gender discrimination.

Structural inequalities are designed to reinforce power imbalances. Before systemic change can occur, sources and concentration of that power must first be laid bare through educational reflection that prompts political will and collective action—what Paulo Freire refers