

## Education for Sustainable Healthcare: Leadership to get from here to there

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### Abstract

The current global crises, including climate, COVID-19, and environmental change, requires global collective action at all scales. These broad socio-ecological challenges require the engagement of diverse perspectives and ways of knowing and the meaningful engagement of all generations and stages of personal and professional development. The combination of systems thinking, change management, quality improvement approaches and models, appreciative/strength-based approaches, narratives, storytelling and the strengths of Indigenous knowledges, offer synergies and potential that can set the stage for transformative, strengths-based education for sustainable healthcare (ESH). The need for strong leadership to enact a vision for ESH is outlined here with the intent to enable and nurture the conditions for change, ultimately improving health and well-being across generations.

*“Where is the wisdom we have lost in knowledge?  
Where is the knowledge we have lost in information?”  
TS Eliot (1934)*

### Introduction

Combined global crises, including climate, COVID-19, and environmental change, requires global collective action at all scales. Such socio-ecological challenges require the engagement of diverse perspectives and ways of knowing, in addition to the meaningful engagement of all generations and stages of personal and professional development. It also calls on health professionals - as healers if you will - to make urgent yet thoughtful contributions to actions, and for healthcare education systems, their leaders and influencers, to recognize rapid social-

ecological changes as complex challenges directly rooted in ‘place-based experiences’ within the societies and ecosystems on which we depend. The attendant responsibility embraces all health and social care professions across the full span of lifelong learning, and requires interprofessional learning and working (Schwerdtle et al. 2020). There is also an issue of intergenerational equity and justice that cannot place an undue responsibility and emphasis on new-to-the-professions learners. The nature, objectives, methods, analysis and assessment of success for the needed *Education for Sustainable Healthcare* (ESH) curricula and collaborative ways of working are well outlined in the preceding contributions in this special issue of *Medical Teacher*.

The overarching vision for ESH through this time of great change is seen through the lens of *collective* (Eckert et al. 2014) and *regenerative* (Hutchins and Storm 2019) leadership. The ESH vision emphasises environmental accountability through the active stewardship (caretaking) of resources by all stakeholders while providing faculty development that ensures a well-prepared health workforce that is knowledgeable about the impact and influence the environment has on health (Tun et al. 2020). This concluding commentary identifies the *next steps* for the implementation of the ESH vision by building on the information, knowledge, experience and wisdom presented in the previous papers, and highlighted by relevant approaches to leading and sustaining change. We outline how ESH can be animated to stimulate change on policies, programs and collective actions in the global commons through the application of change strategies taking three interconnected approaches: A systems thinking perspective, enabling conversations and stories, and translating vision into action. These approaches focus on creating and enabling the conditions for the formulation of meaningful actions and equipping people with the tools to enact impactful changes.

### *A systems thinking perspective*

A complex systems thinking approach provides a lens that overtly acknowledges the interdependency and interrelationships of all agents in the systems, that ‘simple’ rules or changes can lead to large effects, and that a change in one part of the system can have unanticipated consequences throughout the system (Till et al. 2016; Obolensky 2017). The combined goals of health and sustainability demand that we consider the context of our actions in new ways, including overt attention to both the social and the ecological context for health and healthcare with focused attention to different scales of influence (Parkes et al. 2019; Buse et al. 2019). ESH recognizes that the health of people and their planet are linked through interdependent living systems from local, bioregional to planetary scales and across generations and cultures, including Indigenous knowledges (Redvers 2018; Horwitz and Parkes 2019; Redvers 2020). Likewise, ESH requires attention to the range of social influences and interactions across the education system(s) (academic, regulatory, accreditation, credentialing), and as part of allied social change efforts (advocacy and leadership, policy, regulation, community engagement) (Woollard and Boelen 2012; Parkes et al. 2019). These actions exemplify *regenerative leadership* (Hutchins and

Storm 2019) and *global leadership* (Javidan and Walker 2012) in systems change implementation.

Two useful models for working in complex adaptive systems are Snowden and Boone's (2007) '*Cynefin*' framework which suggests that leaders need different strategies and approaches for planning change and decision-making in various 'zones' (simple, complicated, complex and chaotic), and Stacey's (1996) '*Certainty-Agreement*' matrix which reminds leaders to consider both these aspects when stimulating large scale change or responding to external changes. Leadership in complex systems, as opposed to complicated systems, is founded upon relationships and feedback loops as opposed to command-control mechanisms which assume linear cause and effect (Glouberman and Zimmerman 2002). Adaptive leaders who can take a perspective from outside or above the situation or organization (as Heifetz and Linsky (2002) would say: who '*get off the dance floor and go to the balcony*'), are able to more efficiently facilitate sustainable change through their understanding of how people and systems work and interact with one another to *co-create* change (Obolensky 2017). Such leaders are able to create safe spaces for both themselves and their teams to work with uncertainty and ambiguity and have '*fierce conversations*' in order to generate emergent change. The leader's role is to enable those they influence to see planetary health action and educating for environmentally sustainable healthcare practice as both *desirable* and *doable* in order to cultivate a powerful force for positive change and an inspirational vision for the health and well-being of communities and natural systems.

In the context of the range of systems and subsystems that constitute the global educational commons, many active initiatives from the local to national to the international level share the purpose of creating life-long-learners dedicated to serving society. Such international networks as the [Global Consensus for Social Accountability](#) (GCSA), [Towards Unity for Health](#) (TUFH), [FAIMER](#) and the [World Health Organisation](#) can act as 'nodes' or 'attractors' and influencers for positive change. In a framework of social accountability (e.g. [Training for Health Equity Network](#) (THEnet), [Tunis Declaration](#)), wide ranging efforts can become synergistic in advancing a core aim of ESH - the convergence of health education with ecological approaches. A specific example of this is the revision of the AMEE (Association of Medical Education in Europe) [ASPIRE](#) social accountability standards to include environmental accountability. Implicit in this approach is the need to foster the skills of *advocacy* and *activism* as essential features of professional environmental and social accountability (McKimm and McLean 2020).

### **Case Study 1. Canadian Federation of Medical Students (CFMS) Health and Environment Adaptive Response Task Force (HEART) Initiative**

Members of the HEART initiative, which is a movement that was started by the CFMS, have responded to the call upon medical schools to integrate teaching related to climate change into their curricula by 2020 by creating a set of core competencies on planetary health (Hackett et al, 2020). These core competencies include the effects of climate change and other

environmental changes on health while promoting advocacy and providing a framework for curricular development in medical education (Hackett et al. 2020). The CFMS has also been instrumental in creating a movement for sustainable healthcare in Canada, such as the ‘Project Green Healthcare’, by conducting needs assessments and quality improvement projects in hospitals with the aim of providing more green healthcare (CFMS 2020). A further example of a student-led tool for advocacy is the International Federation of Medical Student Organizations (IFMSA) *Students' Toolkit on Social Accountability in Medical Schools*: [IFMSA](#) in addition to their recent adoption of the ‘2020 Vision of Climate Change in Medical curricula’ (El Omnia et al. 2020).

### ***Enabling conversations and stories***

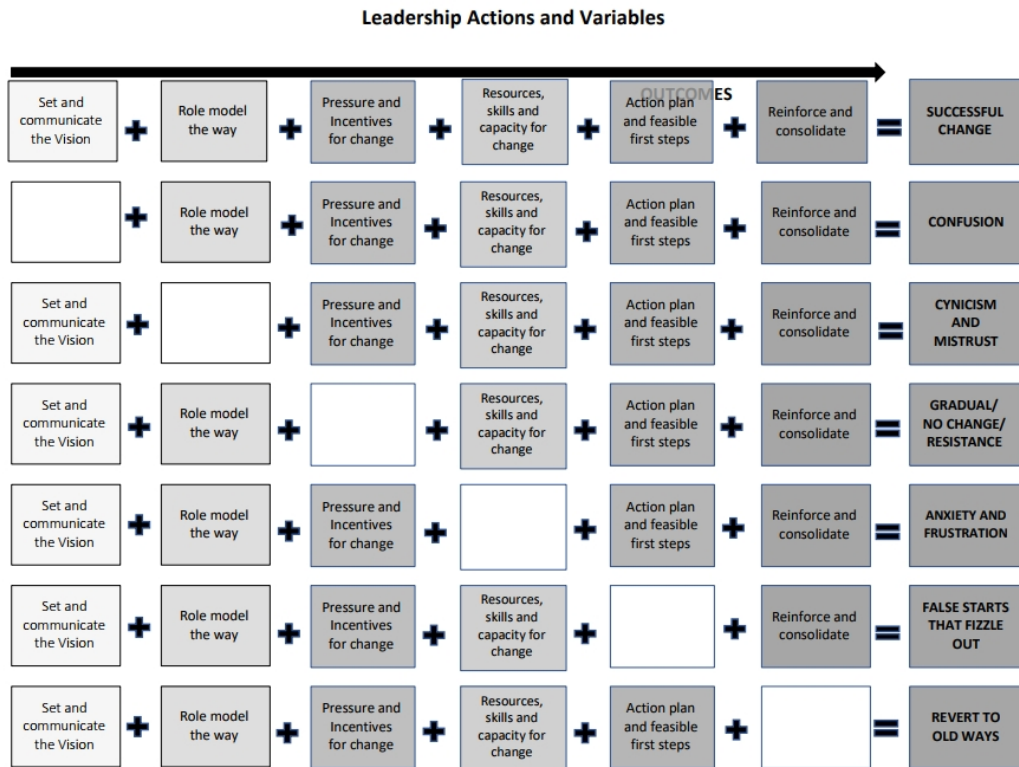
Leadership in complex systems also needs to take into account the multiple perspectives and wisdom from various stakeholders to help generate a ‘rich picture’ of the envisaged change and evaluate its potential impact on different interest groups, through listening to their stories, concerns and ideas. There is an urgent need to pave the way for successful change by embracing all disciplines that influence the health of people, communities and that of the planet within which we live. In this space, special attention and continued engagement with international student learner bodies as powerful agents for change will be imperative, whilst not having them bear an undue onus of responsibility.

The role of narratives and stories from diverse stakeholders in this ESH change-management process should not be underestimated. Drawing on longstanding calls to value qualitative, narrative and arts-based approaches to communicate complex health information; it is clear that *relationships* are especially relevant for health, roles and responsibilities within our shared planetary home (Sandelowski 1991; Charon 2001; King 2003; Rosenthal 2003). Narratives and stories are also common tools in Indigenous research methodologies (Datta 2017). Western-based science can be used in conjunction and in partnership with these narratives; while also valuing the extensive and ongoing work of traditional Indigenous knowledges as a standalone authority that includes the science, stories, and ways of knowing that have the potential to pave the way for sustainability practices in all facets of our societies. Indigenous knowledges clearly emphasize that relationality and interconnectedness with all things is not a willed choice - it is a reality (Redvers 2018). This viewpoint emphasizes the shared condition of entanglement we find ourselves in on a rapidly changing planet. Such interconnectedness means that we have a collective existence to uphold on a finite planet (Stein 2019). Therefore, the fundamental switch to *biospheric* based health education values will require the inclusion of a respectful diversity of perspectives and backgrounds at decision-making tables, including in faculty positions and in student body populations around the world (Redvers et al. 2020).

### ***Translating vision into action***

‘Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world’ (Barker 1993).

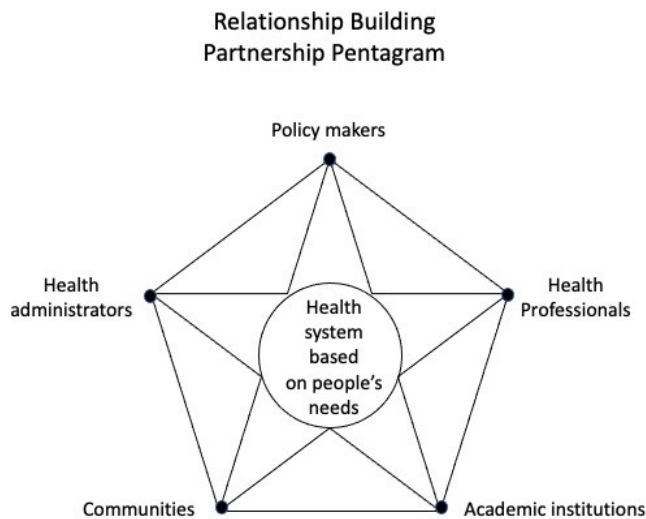
In light of the above quote, equipping individuals and groups with effective tools, frameworks and methodologies for planning, operationalizing and implementing ESH changes is essential. One useful tool (see Figure 1) sets out the various variables needed for a specific vision to result in successful change while also outlining what can happen if any of these variables are not addressed.



**Figure 1.** Elements of successful change (adapted from Kostner, Villa and Thousand 2000).

ESH should also be examined through a *quality improvement* lens with engagement from all partners in the learning environment and at all scales of influence (policy makers, those who implement policy, teachers, researchers, students, patients, and communities) (Mortimer 2018). The productive interaction of all facets of health professions’ education systems can lead to novel approaches to issues related to sustainability and human health situated within a complex system (Plsek et al. 2001). This productive interaction has been clearly exemplified by the many existing and evolving tools and resources on environmental sustainability in HPE, including eco-social approaches to health and planetary health, that are available for institutional adaptation

(Parkes et al. 2019; Walpole et al. 2019; Huss et al. 2020; Barna et al. 2020). In advancing needed organizational change in the health and educational systems, the simultaneous convening of an environmental and social accountability “partnership pentagram” (Figure 2, Woollard 2006) and using an *appreciative inquiry* approach (Watkins and Stavros 2006) has proven effective in both high and low resource contexts (Rourke 2006; Green-Thompson et al. 2017).



**Figure 2.** Simultaneous and coordinated partnerships are required for positive change (adapted from Woollard 2006).

Other established methods for system-wide change initiatives can also provide an important process map for institutions to follow in implementing a planetary health rooted paradigm and operational shift for ESH. For example, Kotter’s (2007) *eight-stage process* can offer a helpful framework to better ensure that evidence-based systems change can be adapted to ESH initiatives, noting the value of each of the following stages: *establish a sense of urgency, form a powerful guiding coalition, create a vision, communicate the vision, empower others to act on the vision, plan for and create short term wins, consolidate improvements and produce more change, institutionalize new approaches*. These change processes can then be formally measured through identified ESH outcome indicators such as those outlined by Madden et al. (2020) and analyzed at both the health education microsystem level (e.g. the classroom and clinic), and at the institutional macro system level (including policies, strategies and processes).

## Conclusions

Health professions’ leaders and institutions must urgently support our students, faculty and education systems using a range of leadership and change frameworks through the lens of ESH. The combination of systems thinking, change management, quality improvement approaches and models, appreciative/strength-based approaches, narratives, storytelling and the strengths of

Indigenous knowledges, offers synergies and potential that can set the stage for transformative, strengths-based ESH.

Agreeing to and implementing a lasting vision for ESH, its people, systems and infrastructure is important, urgent and attainable. A considerable body of existing knowledge can be animated to stimulate change and meaningful impact on policies, programs and collective actions in the global education commons. The overarching educational vision for planetary health (and sustainable healthcare) emphasizes ecological and social accountability through collective leadership and active stewardship to ensure a well-prepared health workforce that is equipped to adapt to and mitigate the health impacts of global environmental change. Strong leadership that enables and nurtures the conditions for change to emerge is urgently required, coupled with an understanding of change management processes that continue to build on the information, knowledge and wisdom that will ultimately improve health and well-being across generations. The ESH frameworks and resources described in this Special Issue provide the tools that courageous leaders need to make sustainable and meaningful change.

### **Practice Points**

- Implementation and operationalizing of ESH principles into a vision for health professions' education is urgent and attainable.
- Taking a systems-thinking perspective that reflects social and ecological context is essential given the complexity and interrelatedness of health education and the environment.
- A range of existing leadership approaches and change frameworks can be leveraged into ESH curriculum development.
- Inclusion of a diversity of perspectives and backgrounds at decision-making tables, including in faculty positions and in student body populations around the world, is essential for inclusive and equity-driven HPE change making processes in relation to ESH.

### **Glossary Terms**

***Appreciative inquiry:*** Attempts to use ways of asking questions and envisioning the future in order to foster positive relationships.

***Biospheric:*** Attribution to the biosphere itself (i.e., the part of the earth and its atmosphere in which living exist or that is capable of supporting life).

***Place-based experiences:*** Are the utilization of our 'home' (including natural and human-made landscapes in rural, urban and suburban contexts) to inform and root our life experiences and our ways of looking at and responding to the world.

***Strengths-based (or asset-based) approaches:*** Focus on individuals' strengths (including personal strengths and social and community networks) and not on their deficits. Strengths-based

practice is holistic and multidisciplinary and works with the individual to promote their well-being.

### **Notes on Contributors**

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## References

- Areas of Excellence. 2020. [accessed 2020 June 10]. <https://www.aspire-to-excellence.org/Areas+of+Excellence/>
- Barker JA. 1993. *Paradigms: Business of Discovering the Future*. Harper Collins.
- Barna S, Maric F, Simons J, Kumar S, Blankestijn. 2020. Education for the Anthropocene: Planetary health, sustainable healthcare and the health workforce. *Med. Teach.* 42(10).
- Buse CG, Smith M, Silva DS. 2019. Attending to scalar ethical issues in emerging approaches to environmental health research and practice. *Monash Bioeth. Rev.* 37:4–21. <http://doi.org/10.1007/s40592-018-0080-3>.
- Canadian Federation of Medical Students (CFMS). 2020. Health and Environment Adaptive Response Task Force. [accessed 2020 June 15]. <https://www.cfms.org/what-we-do/global-health/heart.html>
- Charon R. 2001. Narrative medicine: A model for empathy, reflection, profession, and trust. *JAMA.* 286(15):1897-1902. <http://doi.org/10.1001/jama.286.15.1897>.
- Datta R. 2017. Traditional storytelling: an effective Indigenous research methodology and its implications for environmental research. *AlterNative.* 14(1):35-44. <https://doi.org/10.1177/1177180117741351>.
- Eckert R, West M, Altman D, Steward K, Pasmore B. 2014. *Delivering a collective leadership strategy for health care*. London Centre for Creative Leadership: The Kings Fund.
- El Omrani O, Dafallah A, Paniello B, Amaro B, Taneja S, Amzil M, Sajib M, Ezzine T. 2020. Envisioning planetary health in every medical curriculum: An international medical student organization’s perspective. *Med. Teach.* 42(10).
- Foundation for Advancement of International Medical Education and Research (FAIMER). 2001-2020. [accessed 2020 June 10]. <https://www.faimer.org>
- Global Consensus for Social Accountability of Medical Schools. 2010. [accessed 2020 June 10]. <http://healthsocialaccountability.sites.olt.ubc.ca/files/2011/06/11-06-07-GCSA-English-pdf-style.pdf>
- Glouberman S, Zimmerman B. 2002. *Complicated and Complex Systems: What Would Successful Reform of Medicare Look Like?* Commission on the Future of Health Care in Canada: Discussion Paper No. 8. 8. [Accessed 2020 June 10].

<https://www.alnap.org/system/files/content/resource/files/main/complicatedandcomplexsystems-zimmermanreport-medicare-reform.pdf>

Green-Thompson LP, McInerney P, Woollard B. 2017. The social accountability of doctors: a relationship based framework for understanding emergent community concepts of caring. *BMC Health Serv Res.* 17(1):269. <http://doi.org/10.1186/s12913-017-2239-7>.

Huss NM, Ikiugu M, Hackett F, Sheffield P, Palipane N, Groome J. 2020. Education for sustainable healthcare: From learning to professional practice. *Med. Teach.* 42(10).

Hackett F, Got T, Kitching GT, MacQueen K, Cohen A. 2020. Training Canadian doctors for the health challenges of climate change. *Lancet Planet. Health.* 4(1):e2-e3. [https://doi.org/10.1016/S2542-5196\(19\)30242-6](https://doi.org/10.1016/S2542-5196(19)30242-6).

Heifetz R, Linsky M. 2002. A survival guide for leaders. *Harv. Bus. Rev.* 80(6):65-74.

Horwitz P, Parkes MW. 2019. Intertwined strands for ecology in planetary health. *Challenges.* 10(1):20. <https://doi.org/10.3390/challe10010020>.

Hutchins GS and Storm L. 2019. *Regenerative Leadership: The DNA of life-affirming 21st century organizations.* Wordzworth Publishing.

Javidan M, Walker JL. 2012. A whole new global mindset for leadership. *HRPS.* 35(2):36-41.

King T. 2003. *The truth about stories: A native narrative.* Vancouver, BC: House of Anansi.

Knoster T, Villa RA, Thousand JS. 2000. A framework for thinking about systems change. Chapter in, Villa RA and Thousand JS (eds) (2<sup>nd</sup> edition) *Restructuring for caring and effective education: Piecing the puzzle together:* 93-128. Brookes Publishing Co.

Kotter JP. 2007. Leading change: Why transformation efforts fail. *Harv. Bus. Rev.* 85:1.

Madden DL, McLean M, Brennan M, Moore A. 2020. Why use indicators to measure and monitor the inclusion of climate change and environmental sustainability in health professions education? *Med. Teach.* 42(10).

McKimm J, McLean M. 2020. Rethinking health professions' education leadership: Developing 'eco-ethical' leaders for a more sustainable world and future. *Med. Teach.* 1-6. <https://doi.org/10.1080/0142159X.2020.1748877>.

Mortimer F, Isherwood J, Wilkinson A, Vaux E. 2018. Sustainability in quality improvement: redefining value. *Future Healthc J.* 5(2):88. <http://doi.org/10.7861/futurehosp.5-2-94>.

- Obolensky, N. 2010. *Complex Adaptive Leadership*. London: Routledge.  
<https://doi.org/10.4324/9781315264929>
- Parkes MW, Poland B, Allison S, Cole DC, Culbert I, Gislason MK, Hancock T, Howard C, Papadopoulos A, Waheed F. 2020. Preparing for the future of public health: ecological determinants of health and the call for an eco-social approach to public health education. *Can J Public Health*. 111(1):60-64. <http://doi.org/10.17269/s41997-019-00263-8>.
- Plesk PE, Greenhalgh T. 2001. Complexity science: The challenge of complexity in health care. *BMJ*. 323:625-8. <https://doi.org/10.1136/bmj.323.7313.625>.
- Redvers N. 2018. The Value of Global Indigenous Knowledge in Planetary Health. *Challenges*. 9(2):30. <https://doi.org/10.3390/challe9020030>.
- Redvers N, Schultz C, Prince MV, Cunningham M, Jones R. 2020. Indigenous Perspectives on Education for Sustainable Healthcare. *Med. Teach*. 42(10).
- Rosenthal G. 2003. The healing effects of storytelling: On the conditions of curative storytelling in the context of research and counseling. *Qual. Inq*. 9(6):915–933.  
<https://doi.org/10.1177/1077800403254888>.
- Rourke J. 2006. Social accountability in theory and practice. *Ann Fam Med*. 4(suppl 1):S45-8. <http://doi.org/10.1370/afm.559>.
- Sandelowski M. 1991. Telling stories: Narrative approaches in qualitative research. *J. Nurs. Scholarsh*. 23(3):161–166. <https://doi.org/10.1111/j.1547-5069.1991.tb00662.x>.
- Schwerdtle PN, Horton G, Kent F, Walker L, McLean M. 2020. Education for sustainable healthcare: A transdisciplinary approach to transversal environmental threats. *Med. Teach*. 42(10).
- Snowden DJ, Boone ME. 2007. A leader's framework for decision making. *Harv. Bus. Rev*. 85(11):68.
- Stacey RD. 1996. *Strategic management and organizational dynamics*. London: Pitman Publishing.
- Stein S. 2019. The Ethical and Ecological Limits of Sustainability: A Decolonial Approach to Climate Change in Higher Education. *J Environ Educ*. 1:15.  
<https://doi.org/10.1017/aee.2019.17>.
- The Network: Towards Unity for Health. 2005. [accessed 2020 June 10].  
<https://thenetworktufh.org>
- THEnet: The Training for Health Equity Network. 2019-2020. [accessed 2020 June 10].  
<https://thenetcommunity.org/>

- The Tunis Declaration on Reinforcing the Rule of Law and Human Rights. 2019. [accessed 2020 June 10]. <https://www.icj.org/wp-content/uploads/2019/04/Universal-ICJ-The-Tunis-Declaration-Advocacy-2019-ENG.pdf>
- Till A, Dutta N, McKimm J. 2016. Vertical leadership in highly complex and unpredictable health systems. *Brit J Hosp Med.* 77(8):471-475. <https://doi.org/10.12968/hmed.2016.77.8.471>.
- Tun S, Wellbery C, Teherani A. 2020. Faculty development and partnership with students to integrate sustainable healthcare into health professions education. *Med. Teach.* 42(10).
- Walpole SC, Barna S, Richardson J, Rother HA. (2019). Sustainable healthcare education: Integrating planetary health into clinical education. *Lancet Planet. Health.* 3(1):e6–e7. [https://doi.org/10.1016/S2542-5196\(18\)30246-8](https://doi.org/10.1016/S2542-5196(18)30246-8).
- Watkins J, Stavros J. 2009. *Practicing Organization Development: A Guide for Leading Change* (3rd Edition). Jossey-Bass. Chapter 7.
- Woollard RF. 2006. Caring for a common future: Medical schools' social accountability. *Med. Educ.* 40:301–313. <https://doi.org/10.1111/j.1365-2929.2006.02416.x>.
- Woollard B, Boelen C. 2012. Seeking impact of medical schools on health: meeting the challenges of social accountability. *Med. Educ.* 46(1):21-27. <https://doi.org/10.1111/j.1365-2923.2011.04081.x>.
- WHO | World Health Organization. 2006-2020. [accessed 2020 June 10]. <https://www.who.int>