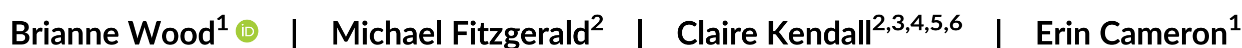
Received: 14 December 2020 | Revised: 15 April 2021 | Accepted: 10 May 2021
DOI: 10.1002/lrh2.10277

COMMENTARY

Learning Health Systems

Integrating socially accountable health professional education and learning health systems to transform community health and health systems



Brianne Wood[1] | Michael Fitzgerald[2] | Claire Kendall[2,3,4,5,6] | Erin Cameron[1]

[1]Medical Education Research Lab in the North, Northern Ontario School of Medicine, Thunder Bay, Ontario, Canada
[2]C.T. Lamont Primary Health Care Research Centre, Bruyère Research Institute, Ottawa, Ontario, Canada
[3]Office of Social Accountability, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada
[4]Institut du Savoir Montfort, l'Hôpital Montfort, Ottawa, Ontario, Canada
[5]Clinical Epidemiology Research Program, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada
[6]Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario, Canada

Correspondence
Brianne Wood, Medical Education Research Lab in the North, Northern Ontario School of Medicine, 955 Oliver Rd, Thunder Bay, Ontario P7B 5E1, Canada.
Email: bwood@nosm.ca

Funding information
Northern Ontario School of Medicine

Abstract

A learning health system aims to create value in health systems using data-driven innovations, quality improvement techniques, and collaborations between health system partners. Although the concept is mobilized through cycles of learning, most instantiations of the learning health system overlook the importance of formalized learning in educational settings. Social accountability in health professional education focuses on measurably improving people's health and health care, specifically through education and training activities. In this commentary, we argue that the idea of social accountability clearly articulates a rationale and a broad range of aspirations, whereas the learning health system offers an approach to achieve these goals. With a similar aim to a learning health system, social accountability promotes partnerships between health professional education, the health system, and communities in a way that allows for co-designed and contextualized interventions. On the other hand, learning health systems prioritize data, research, and analytic capacities to facilitate quality improvement. An integrative framework could enhance learning cycles by collectively designing interventions and innovations with people and communities from health, research, and education systems. As well as aspiring to improve population health and health equity, such a framework will consider broader impacts, including the degree of participation amongst a range of partners and the level of responsiveness to partners' priorities.

KEYWORDS
community partnerships, health equity, health professional education, social accountability

1 | INTRODUCTION

Frameworks describing a "learning health system" (LHS) began to emerge in the early 2000s, emphasizing continuous data-driven innovation and improvement throughout all phases and domains of health care delivery. The conceptual glue that binds the disparate individuals, organizations, institutions, and infrastructures of an LHS together is a clear orientation to value-enhancement, where value is understood in terms of outcomes achieved (ie, health care and health outcomes) versus costs to achieve them.[1-3] This aspiration is then realized through *learning cycles*, which involve knowledge generation and knowledge translation through research and health practice.

Grounded in attributes of adaptability, flexibility, and reflexivity, many LHS frameworks suggest that we can create meaningful impact

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
© 2021 The Authors. *Learning Health Systems* published by Wiley Periodicals LLC on behalf of University of Michigan.

by using data and evidence in decision-making, working collaboratively with system partners, and optimizing continuous quality improvement processes. Most often, learning is ascribed to the system itself, rather than to its constituent participants or partners. The system "learns," but without specification as to how data-driven innovations are to be assimilated and absorbed by the various organizations and actors in the system. Furthermore, there is an under-specification of how to transform participants' understanding of the health system and the culture in which the health system is situated. However, contextualized teaching and learning are central to the mandate of health professional education, particularly given the shift from informative to transformative learning.[4] Through engagement with communities and stakeholders, schools now focus on developing graduates with leadership capabilities and clinical competencies who commit to providing and advocating for high quality, accessible, and equitable health care for their patients and communities.[4] This social contract between health professional education and society is known as social accountability.

In this commentary, we argue that social accountability in health professional education is critical for LHSs and that these concepts are synergistic and crucial for achieving improved health and care outcomes. Social accountability frameworks articulate a rationale and a broad range of outcomes (eg, health equity and improved community health), whereas LHS frameworks delineate an approach to attaining this. Consequently, the role and contributions of health professional education should be explicitly defined in the theory and practice of an LHS. By acknowledging that the population needs to drive both health and education systems, health professional education is then a necessary strategy to meet population health and health system needs. Conversely, an LHS framework can mobilize social accountability in health professional education by facilitating the use and analysis of big data for research and translation, and supporting a coordinated effort to generate and translate relevant, contextualized knowledge for LHS participants.

2 | SITUATING THE LHS

Although there is no single agreed-upon definition or implementation of an LHS, most descriptions emphasize continuous - and near real-time - learning at different scales by collecting, analyzing, and applying information from repositories of the patient, clinical, service delivery, and research data. To function optimally, LHSs require strategic support, resources, and collaboration from multiple systems (eg, social, political, economic, education), each of which aspires to be a learning system itself, such that learning can occur between these systems as well. Two recent scoping reviews[1,2] have shown that the majority of LHS literature focuses on describing and testing innovations that mobilize an LHS by strengthening research components, including data infrastructure, analytic capacity, research production and evidence synthesis, and decision supports. Consequently, significant resources have been invested in training, methods, and tools for data collection (eg, electronic health records), analysis (eg, machine learning and artificial intelligence), and research evidence synthesis and translation networks.[3,5,6]

Although these innovations represent an essential technical foundation for an LHS, assessments of the benefits for, or impacts on, *people* have been largely missing from the LHS literature.[1-3] Although LHS frameworks advocate for the meaningful patient and community partnerships in their description of structures, processes, and outcomes, there has been little progress in empirically demonstrating the *value* that LHSs have for patients, the public, and communities.[2,3,7] Researchers and other LHS members must continuously ask (and *learn*) how the LHS initiatives affect people's health and care experience, and start to consider broader impacts, including responsiveness to communities' priorities and inclusion of all voices.

3 | SOCIALLY ACCOUNTABLE HEALTH PROFESSIONAL EDUCATION: MEANINGFUL OUTCOMES FOR PEOPLE AND COMMUNITIES

LHSs would benefit from contextualized learning that addresses the needs of patients, communities, diverse actors, and the sub-systems that constitute an LHS. Socially accountable health professional education can provide the required approach through its accountability activities, research orientations, broad range of outcomes, and a vision to improve health outcomes for the people and communities they serve.[8,9] Through building and nurturing partnerships between diverse stakeholders at different levels (individuals, institutions, communities, and systems),[10-12] socially accountable health professional education can inform and transform the learning cycles of an LHS, as well as the planning, implementation, and evaluation it comprises. Educational priority setting, curriculum and pedagogy, and outcomes (eg, learner attitudes and competencies, final practice characteristics, scholarly achievements), co-determined by educational leaders and partners (eg, socially accountable health professional education), are responsive and innovative activities that align with LHS processes and goals.

Over the last two decades, there has been significant investment in conceptualizing and promoting social accountability. However, evidence of health or care delivery improvements is limited,[10,13-15] with most assessments of social accountability being led by researchers and institutions,[16-18] rather than independent appraisals by community and health system partners. Although using an LHS approach (ie, embedding data collection, analysis, and translation) in health professional education activities would help establish upstream and downstream connections between educational activities and health system outcomes, this alone is not sufficient to realize social accountability. There is also the need to explicitly embed socially accountable health professional education in the LHS. By doing so, the LHS could better articulate the need for *relevance*, the imperative of *health equity*, and the *prioritizing of outcomes through stakeholder and community engagement*. Integrating social accountability into the LHS framework would position health professional education - and health professional training more broadly - as a key enabler and contributor to value-based health care.

4 | THE INTEGRATION OF IDEAS: MOBILIZING FOR IMPACT

The LHS and social accountability representations are both grounded in the goals of improving health and health systems, which might be why both concepts are gaining momentum.[13] There is significant variability in how each concept is mobilized, which likely reflects their divergent approaches: the LHS framework prioritizes innovation and rapid research lifecycles, where socially accountable health professional education prioritizes partnerships and contextualized interventions. However, there are important similarities that warrant an integrative approach. Processes and interventions guided by either framework are predicated on relationships and dependencies, which comprise multiple interdependent steps and participants.[19] With such inherent complexity, LHS and social accountability innovations and interventions face similar trade-offs in their operationalization, balancing the risks of a reductive cause-effect design with considerations of generalizability and replicability.[10] Multiple research approaches, including realist inquiry and complexity sciences, are important for understanding the logics and dynamics of such interdependent systems,[20-22] while participatory action approaches will ensure that all voices are represented and that creating change is a priority.[23] Most importantly, during the implementation of an integrative framework, all partners must be consistently and deliberately reflexive so as to question both the impacts of the collective activities and the power dynamics in the partnerships that drive change.

To articulate an integrative LHS and socially accountable health professional education framework, partners in the health and education systems need to collectively determine their shared vision, considering what is most relevant for their contexts, communities, and systems. Diverse people (members of the public/communities, health care providers, researchers, educators, administrators, policy-makers), communities (geographic, cultural, social, etc), and institutions need to be represented in the development of the vision and in the mobilization of the framework. In health professional education, curricula and training should be tailored to address these community needs[12] while also building skills in research, data analysis, and quality improvement techniques.[24] Specialized training in analytics, research, and scientific leadership has been acknowledged in some instantiations of an LHS framework,[3,5,24] often framed as capacity-building or developing competencies.[3] Some studies have described how research trainees can mobilize LHSs[25,26] and how medical students can enhance their continuous quality improvement skills,[27,28] but such *formal learning* is given less attention than other LHS processes or characteristics.[1,3]

For its part, socially accountable health professional education is well-positioned to fill the knowledge gap in the LHS literature and in the operationalization of the LHS, through institutional design, instructional processes, and defined educational outcomes.[4] Recent reforms to health professional education have strengthened the connectivity and coordination of health, education, and research systems through strategic and transdisciplinary alliances, and by incorporating "learning" that transcends classrooms and institutions.[4] Because building and nurturing partnerships is fundamental to bridge the health, research, and education systems in an integrative framework, resources should be invested to develop and enhance the leadership and collaboration skills of formal trainees (eg, health professional students, graduate students), practicing professionals (eg, health care providers, administrators), academics (eg, researchers, educators), and interested community members (eg, community advocates, patients).

Although health professional education can guide best practices in instructional learning (eg, education and formal training), it has struggled to leverage big data and analytics for institution-level and system-level learning.[29-31] The LHS framework can support investigation into links between education activities and patient and community health outcomes. There is a lack of empirical evidence that socially accountable health professional education leads to improved downstream outcomes such as community health and care delivery.[16,29,32] The technological and scientific innovations of many LHSs could be applied and tested within health professional educational settings, particularly given their overlapping goals, values and, in many cases, data sources.[29] Incorporating the LHS framework into health professional education contexts would thus respond to the calls of academics advocating for better data infrastructure and increased analytic capacity at medical schools[33] to leverage existing "big data,"[29] and to be strategic and rigorous throughout the data lifecycle.[30] The "big data"- driven knowledge generation and decision-making that defines the LHS can also create new pathways for community engagement in health professional education, as long as the projects promise bi-directional benefit and are resourced appropriately.[34-36] Establishing the data infrastructure and analytic capacities within the education system and encouraging linkages with similar structures in the health system will allow health professional education to make use of the large amounts of data collected, promote educational scholarship and strategic institutional improvements, and ensure that it can be held accountable.[31]

5 | OPERATIONALIZING AN INTEGRATIVE FRAMEWORK

Moving from theory to practice has been challenging enough for socially accountable health professional education and LHSs independently, so implementing an integrative framework will require intentional and reflective action. The authors are currently developing the first iteration of an integrative model that will better illustrate how these concepts can interact in practice, although it still requires validation and pilot testing. This commentary describes the opportunities, rationale, and enablers for integrating social accountability in health professional education and LHS concepts, though there are theoretical and pragmatic challenges to overcome. Specifically, there still have not been significant or measureable improvements in population health outcomes, health equity, or access to health care under the implementation of either social accountability or learning health systems.[1,4,10] For social accountability, rigid curricula and regulations, misaligned pedagogy, siloes across health professions and sectors,

fee-for-service payment structures in service delivery and clinical teaching, and emphasis on personalized and specialty medicine are barriers to meaningful community engagement and relevant, contextualized education, research, and services.[4,10,37,38] The LHSs literature is rich with technological innovations to facilitate data-driven, population-based learning, but lacks clarity around the roles, responsibilities, and rights of individuals during data collection, management, and sharing and as such, these systems face barriers in acquiring appropriate funding[1,2]

Both concepts represent a means to an end: a way of achieving improved value for people in the health system, including improved health and health care, a healthy workforce, and a sustainable system.[2] A framework that integrates socially accountable health professional education and learning health systems can shift the emphasis from processes to outcomes and impact, by expanding the aims of transformation (eg, empowerment, participation),[10] acknowledging and dismantling power hierarchies in clinical, educational, and interprofessional relationships,[38] and carefully examining data ethics in the local health and education contexts.[39] This means that the actors - people and organizations - in socially accountable health professional education and LHSs must practice self-reflection, interrogating whether the transformative goals of their respective systems are realized.[13,40] In an integrative socially accountable LHS, a "fit-for-purpose" health workforce has the professional competencies and contextual expertise to transform local communities. Strategic and operational planning for health services would align with education and research planning, which in turn would leverage the skills and responsibilities of different stakeholders, minimize the potential for duplication, and encourage a well-rounded approach to new initiatives (eg, research expertise in program evaluation, administrative expertise in implementation, educational responsibilities in organizational models). Continuous improvement cycles and interventions in health organizations and educational institutions would draw from data ethics, complexity theory, and social science approaches to advance priorities agreed upon by actors across both health and education systems.[22,38,39] Integrating health professional education within the health system acknowledges that learning, teaching, and assessment is not just a node early in the health system pipeline. Rather, education is a dynamic, interdependent system that should bring together patients, community leaders, health professionals, educators, administrators, funders, and other health system stakeholders to collectively effect change in health and care outcomes, as well as broader societal impacts (eg, equity).[10,41] This will impact the implementation of LHSs by ensuring a competent workforce to accelerate individual and system learning, acknowledging the need for adapted resource allocation models (which will in turn affect types of governance and care delivery), and informing a strategy for learning analytics that captures ethical considerations from education, health, and community perspectives.[29,30,42]

6 | CONCLUSION

As both frameworks gain momentum in both theory and practice, we recommend that an integrative framework of LHS and socially accountable health professional education be robustly developed through partners from health, research, and education systems. An integrative framework will leverage LHS and socially accountable health professional education concepts and existing theories of change, while adapting to community contexts and priorities. This framework should be refined and tested, taking what is known about LHSs and socially accountable health professional education to generate robust evidence about the contexts and circumstances that will help achieve the aspirations of an integrative approach. Specifically, the technical and scientific innovations from the LHS body of literature, as well as the framework's emphasis on agility, can enhance how health professional education impacts health systems and thus health outcomes. Correlatively, socially accountable health professional education's focus on health equity can ensure that LHSs partner with communities and stakeholders to prioritize their needs and collectively work to address their health priorities. Importantly, we must move beyond simply theorizing about LHSs and socially accountable health professional education, to apply this integrative approach in the real world.

ACKNOWLEDGEMENTS

This project was completed as part of Dr. Brianne Wood's postdoctoral fellowship at the Northern Ontario School of Medicine.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ORCID

Brianne Wood https://orcid.org/0000-0001-9958-4824

REFERENCES

1. Platt JE, Raj M, Wienroth M. An analysis of the learning health system in its first decade in practice: scoping review. *J Med Internet Res*. 2020;22(3):e17026.
2. Menear M, Blanchette M-A, Demers-Payette O, Roy D. A framework for value-creating learning health systems. *Health Res Policy Syst*. 2019;17(1):79.
3. Lavis J, Gauvin F, Mattison C, Moat K, Waddell K, Reid R. Research literature about rapid-learning health systems. Hamilton, Canada: McMaster Health Forum; 2018 Dec p. 34. (Creating rapid-learning health systems in Canada).
4. Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923-1958.
5. Krumholz HM. Big data and new knowledge in medicine: the thinking, training, and tools needed for a learning health system. *Health Aff (Millwood)*. 2014;33(7):1163-1170.
6. Etheredge LM. A rapid-learning health system. *Health Aff (Millwood)*. 2007;26(Supplement 1):w107–18.
7. Brooks D, Douglas M, Aggarwal N, Prabhakaran S, Holden K, Mack D. Developing a framework for integrating health equity into the learning health system. *Learn Health Syst*. 2017;1(3):e10029.
8. Boelen C, Dharamsi S, Gibbs T. The social accountability of medical schools and its indicators. *Educ Health*. 2012;25(3):180.
9. Rourke J. Social accountability in theory and practice. *Ann Fam Med*. 2006;4(Suppl 1):S45-S48.
10. Boydell V, McMullen H, Cordero J, Steyn P, Kiare J. Studying social accountability in the context of health system strengthening: innovations and considerations for future work. *Health Res Policy Syst*. 2019; 17(1):34.

11. Preston R, Larkins S, Taylor J, Judd J. Building blocks for social accountability: a conceptual framework to guide medical schools. *BMC Med Educ*. 2016;16(1):227.
12. Boelen C, Heck JE, Health WHOD of D of HR for. Defining and measuring the social accountability of medical schools. 1995 [cited 2020 Aug 27]; https://apps.who.int/iris/handle/10665/59441
13. Ritz SA, Beatty K, Ellaway RH. Accounting for social accountability: developing critiques of social accountability within medical education. *Educ Health (Abingdon)*. 2014;27(2):152-157.
14. Leinster S. Evaluation and assessment of social accountability in medical schools. *Med Teach*. 2011;33(8):673-676.
15. Buchman S, Woollard R, Meili R, Goel R. Practising social accountability. *Can Fam Physician*. 2016;62(1):15-18.
16. Reeve C, Woolley T, Ross SJ, et al. The impact of socially-accountable health professional education: a systematic review of the literature. *Med Teach*. 2017;39(1):67-73.
17. Mullan F. Social Mission in health professions education: beyond Flexner. *JAMA*. 2017;318(2):122-123.
18. Mullan F, Chen C, Petterson S, Kolsky G, Spagnola M. The social mission of medical education: ranking the schools. *Ann Intern Med*. 2010;152(12):804-811.
19. Lowe T, French M, Hawkins M, Hesselgreaves H, Wilson R. New development: Responding to complexity in public services—the human learning systems approach. *Public Money & Management*. 2020;1-4. https://doi.org/10.1080/09540962.2020.1832738.
20. Ellaway RH, Kehoe A, Illing J. Critical realism and realist inquiry in medical education. *Acad Med* [Internet]. 2020 [cited 2020 Jun 11];95:984-988. https://journals.lww.com/academicmedicine/pages/articleviewer.aspx?year=9000&issue=00000&article=97261&type=Abstract.
21. Stoto M, Parry G, Savitz L. Analytical methods for a learning health system: 4. Delivery system science. *EGEMs Gener Evid Methods Improve Patient Outcomes*. 2017;5(1):31.
22. Greenhalgh T, Papoutsi C. Spreading and scaling up innovation and improvement. *BMJ*. 2019;365:l2068.
23. Jull J, Giles A, Graham ID. Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. *Implement Sci* [Internet]. 2017 [cited 2019 Oct 24];12:150. https://doi.org/10.1186/s13012-017-0696-3.
24. Forrest CB, Chesley FD, Tregear ML, Mistry KB. Development of the learning health system researcher core competencies. *Health Serv Res*. 2018;53(4):2615-2632.
25. Reid RJ. Embedding research in the learning health system [internet]. Vol. 16, HealthcarePapers. 2016 [cited 2020 Dec 3]. https://www.longwoods.com/content/24724/healthcarepapers/embedding-research-in-the-learning-health-system
26. McMahon M, Bornstein S, Brown A, Tamblyn R. Training for Impact: PhD Modernization as a Key Resource for Learning Health Systems. *Healthcare Policy/Politiques de Santé*. 2019;15(SP):10–15. https://doi.org/10.12927/hcpol.2019.25983.
27. Wong BM, Etchells EE, Kuper A, Levinson W, Shojania KG. Teaching quality improvement and patient safety to trainees: a systematic review. *Acad Med J Assoc Am Med Coll*. 2010;85(9):1425-1439.
28. Jones AC, Shipman SA, Ogrinc G. Key characteristics of successful quality improvement curricula in physician education: a realist review. *BMJ Qual Saf*. 2015;24(1):77-88.
29. Chahine S, Kulasegaram K, Wright S, et al. A call to investigate the relationship between education and health outcomes using big data. *Acad Med*. 2018;93(6):829-832.
30. Ellaway RH, Topps D, Pusic M. Data, big and small: emerging challenges to medical education scholarship. *Acad Med*. 2019;94(1):31-36.
31. Ellaway RH, Pusic MV, Galbraith RM, Cameron T. Developing the role of big data and analytics in health professional education. *Med Teach*. 2014;36(3):216-222.
32. Kalet AL, Gillespie CC, Schwartz MD, et al. New measures to establish the evidence base for medical education: identifying educationally sensitive patient outcomes. *Acad Med*. 2010;85(5):844-851.
33. Rosenberg ME, Gauer JL, Smith B, Calhoun A, Olson APJ, Melcher E. Building a medical education outcomes Center: development study. *JMIR Med Educ*. 2019;5(2):e14651.
34. Grayson S, Doerr M, Yu J-H. Developing pathways for community-led research with big data: a content analysis of stakeholder interviews. *Health Res Policy Syst*. 2020;18(1):76.
35. Mullins CD, Wingate LT, Edwards HA, Tofade T, Wutoh A. Transitioning from learning healthcare systems to learning health care communities. *J Comp Eff Res*. 2018;7(6):603-614.
36. Paul J, Davidson R, Johnstone C, Loong M, Matecsa J, Guttmann A, Schull MJ. Public engagement can change your research, but how can it change your research institution? ICES Case Study. *International Journal of Population Data Science*. 2020;5(3). https://doi.org/10.23889/ijpds.v5i3.1364.
37. Reddy AT, Lazreg SA, Phillips RL, Bazemore AW, Lucan SC. Toward defining and measuring social accountability in graduate medical education: a stakeholder study. *J Grad Med Educ*. 2013;5(3):439-445.
38. Hays RB, Ramani S, Hassell A. Healthcare systems and the sciences of health professional education. *Adv Health Sci Educ*. 2020;25(5):1149-1162.
39. Floridi L, Taddeo M. What is data ethics? *Philos Trans R Soc A Math Phys Eng Sci*. 2016;374(2083):20160360.
40. Kass NE, Faden RR. Ethics and learning health care: the essential roles of engagement, transparency, and accountability. *Learn Health Syst*. 2018;2(4):e10066.
41. Braithwaite J, Churruca K, Long JC, Ellis LA, Herkes J. When complexity science meets implementation science: a theoretical and empirical analysis of systems change. *BMC Med*. 2018;16(1):63.
42. Faden RR, Kass NE, Goodman SN, Pronovost P, Tunis S, Beauchamp TL. An ethics framework for a learning health care system: a departure from traditional research ethics and clinical ethics. *Hast Cent Rep*. 2013;43(s1):S16-S27.

How to cite this article: Wood B, Fitzgerald M, Kendall C, Cameron E. Integrating socially accountable health professional education and learning health systems to transform community health and health systems. *Learn Health Sys*. 2021;5(3):e10277. https://doi.org/10.1002/lrh2.10277