Author’s response to reviews

Title: A framework for value-creating learning health systems

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Author’s response to reviews:

Reviewer 1 comments:

R1: The authors propose a conceptual framework to guide work towards a learning health system in Quebec Canada. They reviewed existing scientific and grey literature on learning health systems and conducted a number of team meeting and consultations with experts to inform their work. They hope that this framework will contribute to greater international efforts in the pursuit of developing value-creating learning health systems. The manuscript does a very nice job of summarizing the growing literature around learning health systems, including several existing conceptual frameworks. The authors highlight an important fact that most of this work has been done in the context of the US health care system, and additional efforts will be needed to adapt this to other international systems, especially single payer systems.

Authors: We thank the reviewer for these positive comments.

R1: While they mention that their framework builds off of existing work, it is not immediately clear what novel contributions or refinements the authors make to those existing frameworks. This could be addressed by the addition of a section or figure that highlights these unique contributions.

Authors: We agree that our paper did not adequately highlight the novel contributions of the framework and our work. We have now added a new section on this topic in the discussion, on page 23:

"Novel contributions
Our conceptual framework presents several strengths relative to other frameworks appearing in the literature. Other frameworks either do not make clear distinctions between the structural, process and outcome components of LHSs (30) or emphasize a single component (e.g. processes or structures) over
others (e.g. (27, 31, 32)). Our framework is more comprehensive and illustrates in a novel way how communities of interest can work to align the structures, processes, and outcomes that are distinct to LHSs. Moreover, our framework explicitly identifies value creation and improvement as the fundamental goal to be pursued by these communities of interest. Our conceptualization of value based on the quadruple aim is also substantively different than those proposed by Porter and other leaders. We note that our framework was intended to meet the needs of stakeholders within the Canadian health system and those systems with similar characteristics. This is reflected in the specific core values that should underpin LHSs established in this country, the use of language that recognizes multiple determinants of health, and the importance of pursuing processes and outcomes in line with population health approaches. Finally, the research conducted to develop the framework led to the identification of 37 case examples of LHSs, a more comprehensive list than what has been found in other reviews and scans (11, 21)."

R1: Additionally, while they identify the need to adapt the concept of a learning health system to single payer systems such as theirs, they do not appear to address this in this manuscript.

Authors: We have attempted to strengthen this aspect of the paper in several ways. First, we better introduce the topic in paragraph 3 of the introduction (page 5). In the results section, we mention how the language around LHSs must be adapted in Canadian contexts given our tradition of emphasizing population health approaches and multiple determinants of health (page 9). We then address the issue of values that are important in Canadian contexts and how these must be accounted for in LHS design (pages 10-11). We also now note in the section on LHS outcomes how goals related to population health are highly valued in Canadian contexts (top page 20) and summarize these ideas in the discussion on page 23.

R1: I do not recommend accepting the manuscript in its current form as it is unclear what the unique contribution is to the existing literature other than serving as a useful review of the current state of LHS frameworks. Revisions to better highlight the novel components would strengthen the paper especially if they can address the adaptations needed for single payer systems.

Authors: We thank the reviewer for these comments, our changes are described above.

Reviewer 2 comments:
R2: It is a well written article. I provided recommendations throughout the text of this article to further improve the quality of this report. Overall, there needs to be a clarification of the definition of "value" so as readers have no confusion what different values are relevant to this framework and also to their own context.

Authors: We have taken steps to clarify the definition of value in the abstract and first paragraph of the introduction. Our full discussion on how we conceptualize value is presented on pages 19-21.

R2: A better explanation how this particular framework could drive implementation of LHS in Canada or any other similar health system. What specific gaps in knowledge does the framework cover? What specific need does it satisfy for providers, healthcare leaders, policy makers, researchers, and all other stakeholders. Who is the primary user of this framework? State that clearly, please.

Authors: Similar to the comments by reviewer 1, we have made attempts to clarify the novel contributions of our framework and how it has been developed to resonate in Canadian contexts (see above). In addition, we have revised our discussion and now more explicitly state how the framework
"Despite these challenges, Canada still seems poised to make progress in LHS implementation over the next decade. The country features numerous prominent public agencies focused on health information and healthcare improvement whose missions seem well aligned with the notion of value-creating LHSs. INESSS has assumed a leadership role in mobilizing support these concepts, notably through its involvement in the Canadian Health Services and Policy Research Alliance (CHSPRA), which fosters collaboration, coordination and strategic investment among over 40 organizations funding and supporting health services and policy research (101). In 2017, CHSPRA launched a training program targeting doctoral and postdoctoral trainees that promotes embedded research within health agencies across the country. In this Health System Impact Fellowship Program, trainees develop an expended set of competencies specifically intended to help them become scientific leaders within emerging LHSs (101). Three authors of this paper are Fellows in this program and our conceptual framework is currently being used to inform the evaluation of this pan-Canadian program. A CHSPRA LHS Working Group will also be using the framework to guide strategic planning of the implementation of LHSs in Canada, along with information gathered from its recently commissioned environmental scan on rapid-learning LHSs (21). At a provincial level, our framework is informing INESSS initiatives such as the CoMPAS+ program, which uses QI collaboratives to promote a culture of continuous quality improvement for chronic disease prevention and management in Quebec primary care settings (105). Already, several communities of interest have been formed to promote reflective practices around care for diabetes, chronic obstructive pulmonary disease, and mental health in order to take actions to improve quality and value in primary care."

R2: There needs to be an explicit mention of the role of quality improvement to LHS to better connect learning cycles, etc. to the implementation of this concept.

Authors: Quality improvement is indeed a key process within LHSs and we discuss this on pages 17-18 of the paper. However, we also now mention QI in our Figure 1 as a key process occurring during the learning cycle (Actions for change – QI and Research).

R2: Results mentioned in your abstract are very interesting but I did not find much substantiating material in the body of your text, one or the other may need to be revised.

Authors: We have made several revisions to our abstract and body of the text. We feel comfortable that these match well, especially when one considers all the information and examples of framework elements presented in our tables.

R2: There is at times excessive reliance on reference 22 (Forest and Martin, 2018); it is relevant of course, but you may want to expand your references to support statements.

Authors: We agree and have diversified our references throughout the discussion section.

R2: The text is often too long. Some potentially important readers may be lost because the articles is too long to read.

Authors: We have revised the entire text and cut several sections that were less essential to our arguments and findings. Despite adding some information to respond to reviewer requests, the article is over 230 words shorter in length. We also extend thanks the managing editor for her suggestions in this area.
Managing editor's comments:
E: Abstract: There needs to be a better link between the concepts of value-creating approaches and the LHS. Also, be clearer about what you mean by value in order to set the right expectations.

Authors: We have revised sentences in the opening paragraph, which now reads:

"Interest in value-based healthcare, generally defined as providing better care at lower cost, has grown worldwide and Learning Health Systems (LHSs) have been proposed as a key strategy for improving value in healthcare. LHSs are emerging around the world and aim to leverage advancements in science, technology and practice to improve health system performance at lower cost. However, there remains much uncertainty around the implementation of LHSs and the distinctive features of these systems. This paper presents a conceptual framework that has been developed in Canada to support the implementation of value-creating LHSs."

E: Mention lower costs rather than better costs.

Authors: We now mention lower costs in the abstract and introduction.

E: Stating that there have been few LHSs emerging outside of US contexts, is this research or assumption based? There may be situations that follow the same motivation or philosophy but do not call themselves LHSs.

Authors: This sentence has been revised but originally was research-based. The systematic review of LHSs conducted by Budrionis (2016) documented 13 cases of LHSs, only one of which was established outside the US. Similarly, of the 37 case examples we identified, only 9 involved cases outside the US. However, we agree with the editor that it is likely that some networks or systems outside the US are structured or pursue goals similar to the LHS model, without using that particular term, which is why we have been more vigilant about such statements throughout the text and mentioned this as a limit on page 24.

E: LHS definition: Consider mentioning the particularities of the Canadian context earlier in the text.

Authors: Thank you for this comment. We have revised the third paragraph of our introduction to better introduce the particularities of the Canadian context. This paragraph now reads (page 5):

"In Canada, several leading organizations now identify the delivery of high-value healthcare as an important system goal (14-18). Similarly, recent reports have described the LHS approach as a fundamental strategy for enabling evidence-driven health system transformation across the country (19-21). However, there remains no consensus in Canada around how value-based healthcare should be defined and little clarity about how LHSs can contribute to value improvement. The LHS concept has emerged primarily within the complex, largely privately-funded U.S. healthcare context, which differs significantly from other systems internationally. Canada’s universal public healthcare system features different institutions, regulations and guiding values and has historically emphasized the importance of population health approaches for social progress (22, 23). Given these contextual differences, there is a need to clarify how the LHS concept applies in Canada and other jurisdictions sharing similar health systems characteristics."

The editor should note that while it was proposed that we remove reference to the emergence of the
LHS concept in the U.S. context (earlier in the introduction), reviewer 1 specifically mentioned this as an important fact. We thus chose to integrate this idea in a better section of the text.

E: Consider explicitly stating how our definition aligns with a population health approach and ecological frameworks.

Authors: We now state this more explicitly in the text on page 9 line 217:

"In line with population health approaches, we see LHSs influencing and being influenced by the complex environments in which they evolve."

E: Core values: Jump sooner into the discussion of how values identified for the LHS match or not Canadian values.

Authors: We have revised this section in an effort to reduce words and present our arguments more concisely. This paragraph now reads (page 10):

"Core values that should underpin LHSs have been identified previously and include accessibility, adaptability, cooperative and participatory leadership, governance, inclusiveness, person-focused, privacy, scientific integrity, transparency, and value in healthcare (39). However, in Canada and other countries with single-payer healthcare systems, LHS implementation may be challenged if these systems do not embody other core societal values, such as equity, fairness and solidarity (40-42). These values can be reflected by meaningful efforts to engage diverse stakeholders in the LHS, empower groups with marginalized voices, promote a sense of collective responsibility for its activities and outcomes, and ensure that its impacts are fairly distributed and serve to reduce disparities in care experiences or population health (43). Also, given the plural leadership in the Canadian health sector, spread among governments, professional groups and actors from other sectors, as well as the growing expectations around public input into healthcare (40), we refer to the value of ‘shared accountability’ rather than ‘governance’. Canadians further expect their health system to remain responsive to their evolving needs through innovation and collaboration (19, 44). The value of ‘open innovation’ reflects this more collaborative approach to innovation that LHSs should strive to achieve (45). Finally, we viewed ‘value in healthcare’ not as an underpinning value but rather as the driving motive for LHSs. Our list of core LHS values with their definitions appears in Table 1."

E: Line 241: Reformulate sentence on health system governance to avoid confusion.

Authors: In an effort to clarify our thought and avoid misinterpretations of our arguments, we have revised our sentence on plural leadership and expectations of the public around input into healthcare. The new sentence is presented above. We agree that while there are growing expectations for public to have a voice in healthcare, we are still far from the ideal regarding actual patient and public involvement in healthcare in Canada.

E: Line 273: Consider the term knowledge brokers or better define the term ‘organizational boundary spanner’.

Authors: We have decided to replace the term ‘boundary spanner’ for ‘knowledge broker’ in the text (line 273) given that the two terms refer to similar ideas but the concept of brokers may be more familiar to readers.
E: Line 284: Provide concrete examples of mechanisms for communication and collaboration.

Authors: We have added examples of mechanisms on line 439. Concrete examples for all pillars can also be found in Table 2, which we now more clearly mention to readers on page 10 (line 284).

E: Line 289: Is PCORNet an example of a scientific pillar too?

Authors: We wholeheartedly agree that some LHS infrastructure, systems or supports may align with multiple pillars at the same time. The categories are not intended to be mutually exclusive. We now make this point explicitly in the text on page 11:

"We identified six main pillars: scientific, social, technological, policy, legal, and ethical pillars, though some LHS supports could align with multiple pillars at the same time."

E: Line 304: ImprovingCareNow has grow into a very successful LHS.

Authors: Thank you for this comment. We have added a reference for the C3N LHS in our Additional file.

E: Discussion: line 488 – Is the correct word modernisation or optimisation of healthcare?

Authors: We are comfortable using the term optimization in this context and have made this switch.

E: Mention links with intersectoral work – a worldwide trend.

Authors: We make a brief reference to the involvement of actors from sectors in health on page 10 line 242.

E: Discussion, 2nd paragraph. – Cite work of Lavis. Cite work of Peckham and Lavis.

Authors: We have cited the work of Lavis, Peckham and others more extensively in our discussion.

E: Discussion: Explain how the framework can guide efforts to improve value.

Authors: As mentioned in response to a comment from reviewer 2, we now more clearly explain how INESSS and the CHSPRA alliance are using our framework to make progress with LHS implementation in Canada (see above).

E: Conclusion – Mention optimization of healthcare, improving value by addressing costs, etc.

Authors: We have revised our conclusion section in order to improve consistency with our text.