



The Alliance for Healthier Communities as a Learning Health System for primary care: A qualitative analysis in Ontario, Canada

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Abstract

Rationale, Aims and Objectives: A learning health system model can be used to efficiently evaluate and incorporate evidence-based care into practice. However, there is a paucity of evidence describing key organizational attributes needed to ensure a successful learning health system within primary care. We interviewed stakeholders for a primary care learning health system in Ontario, Canada (the Alliance for Healthier Communities) to identify strengths and areas for improvement.

Method: We conducted a qualitative descriptive study using individual semistructured interviews with Alliance stakeholders between December 2019 and March 2020. The Alliance delivers community-governed primary healthcare through 109 organizations including Community Health Centres (CHCs). All CHC staff within the Alliance were invited to participate. Interviews were audio-recorded and transcribed verbatim. We performed a thematic analysis using a team approach.

Results: We interviewed 29 participants across six CHCs, including Executive Directors, managers, healthcare providers and data support staff. We observed three foundational elements necessary for a successful learning health system within primary care: shared organizational goals and culture, data quality and resources. Building on this foundation, people are needed to drive the learning health system, and this is conditional on their level of engagement. The main factors motivating staff member's engagement with the learning health system included their drive to help improve patient care, focusing on initiatives of personal interest and understanding the purpose of different initiatives. Areas for improvement were identified such as the ability to extract and use data to inform changes in real-time, better engagement and protected time for providers to do improvement work, and more staff dedicated to data extraction and analysis.

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Conclusions: We identified key components needed to establish a learning health system in primary care. Similar primary care organizations in Canada and elsewhere can use these insights to guide their development as learning health systems.

KEYWORDS

delivery of health care, learning health system, primary health care, qualitative research, quality of health care

1 | INTRODUCTION

Evidence-based primary care can help reduce healthcare costs by preventing expensive hospitalizations and specialty care and lead to a healthier patient population. However, evidence for best practices from traditional research can take years to be integrated into the healthcare system.^{1,2} A popular model for more rapid analysis and integration of best practice is a learning health system, which is an organization or network with a culture of health system improvement where iterative analyses of electronic data are used to efficiently evaluate care processes.^{3,4} More effective care processes are then put into practice and re-evaluated in cycles of learning and improvement.^{3,4} This concept was first identified by the Institute of Medicine in 2007,³ and has gained momentum across the world. However, the majority of learning health systems reported in the literature are hospital-centred healthcare systems in the United States.^{5,6} There are few documented learning health systems in the primary care sector, which are organized separately from the hospital system in most countries.⁵ There are unique considerations for learning health systems within primary care compared to other healthcare settings. For instance, the scope of primary care is much broader, it focuses on mostly preventative care, and it spans the life course from infancy to the elderly.^{7,8}

We have previously described the development of the first learning health system for a primary care organization in Ontario, Canada, the Alliance for Healthier Communities.⁹ The Alliance represents 109 community-governed primary healthcare organizations, including 72 Community Health Centres (CHCs).¹⁰ CHCs serve approximately 600,000 people, providing primary care as part of Ontario's publicly funded healthcare system. The Alliance has an integrated data platform where all CHCs use a common electronic medical record (EMR) with mandatory data standards, and all data across the Alliance are collated and accessible through a secure data warehouse. The Alliance follows a roadmap for the highest quality and equitable care delivery that is tailored to address the needs of more socially disadvantaged individuals.¹¹ Despite the complex needs of the people served, the patient outcomes for CHCs are generally better than other primary care models.^{12,13}

We interviewed Alliance stakeholders before the official launch of their learning health system to identify organizational attributes and strengths that facilitate a learning health system and areas for improvement. The goal of this study was to provide guidance to the Alliance and to other similar primary care organizations as they develop their own learning health systems.

2 | METHODS

2.1 | Study design and setting

We conducted a qualitative descriptive study using individual semistructured interviews with Alliance stakeholders in Ontario, Canada.^{14,15} Although primary care is covered under the provincial healthcare plan, there are many different reimbursement models. Represented by the Alliance, CHCs are one of these models and include salaried family physicians who work with other healthcare providers (HCPs) as a team to deliver person-centred primary care. We followed reporting guidelines for qualitative research.¹⁶

2.2 | Sampling and recruitment

All CHC staff within the Alliance were eligible to participate. We aimed to achieve maximum variation in our sample of Alliance stakeholders based on their role (Executive Directors, managers, healthcare providers, data support staff) and to include diverse CHCs considering rural and urban locations. The Director of Research and Evaluation for the Alliance (J. R.) sent emails to the Executive Directors of all the CHCs inviting their teams to participate. For the six CHCs that expressed interest, the Research Coordinator (C. T.) followed up with individuals by providing a letter of information. As the learning health system concept had not been fully socialized throughout the Alliance at the time of our study, we provided this definition in the information letter and at the beginning of each interview: 'a learning health system describes a health system where evidence for best practice is embedded within the healthcare delivery process, and new knowledge is captured from daily clinical interactions and used to further improve care delivery'.

2.3 | Data collection

D. M. N. (a postdoctoral fellow) and C. T. conducted all individual semistructured interviews between December 2019 and March 2020. Interviews were done in-person at the CHCs, although a few were conducted by video conferencing and one using telephone. Interviews lasted approximately 40 min on average. The interview guide was pilot tested with three Alliance members who were not included in the final sample. We revised the interview guide after the

pilot interviews and throughout the study as new themes emerged or clarification was needed.

We asked general questions about the individual's profession and role within their CHC, as well as their CHC patient population. We then asked about their familiarity with the concept of a learning health system, the level of the Alliance functioning as a learning health system and finally questions exploring various learning health system components (data, people, resources, oversight and monitoring, incentives, organizational culture, identification and prioritization, and impact adapted from Psek et al.^{17,18}).

Field notes were taken during the interviews, and all interviews were audio-recorded and transcribed verbatim. D. M. N. reviewed each transcript for accuracy and uploaded the transcripts to NVivo 11 for data management during the analysis.

2.4 | Analysis

The thematic analysis was both iterative and interpretive. Three researchers (C. T., D. M. N. and J. B. B.) independently reviewed and coded the first five transcripts and then met as a team to discuss and compare coding. Using an inductive approach, D. M. N. developed a coding template based on the initial analysis. The coding template was revised by the analysis team throughout the study. C.T. and D.M.N. completed the coding for the remaining transcripts using the same approach. C. T. and D. M. N. met with J. B. B. after all transcripts were analyzed to further refine the main themes and identify exemplar quotes. Saturation was achieved when no further new themes or subthemes were identified.¹⁹

3 | RESULTS

3.1 | Study participants and CHC characteristics

We interviewed 28 individuals across six CHCs, plus one individual at the Alliance who was not specifically associated with a CHC, for a total of 29 participants. Data saturation was achieved at the end of data collection to permit a robust interpretation of the results. Participants included 8 Executive Directors, 6 managers, 10 HCPs (e.g., family physician, nurse practitioner, nurse, social worker) and 8 data support personnel; a few individuals had more than one of these roles. Three CHCs were urban, two were rural and one was suburban. Participants had worked for their CHC for an average of 6.7 years with a range from 6 months to 22 years.

All participating CHCs described their clients as mostly low income with many experiencing poverty or homelessness. The participants described their CHCs serving newcomers, refugees, people experiencing mental health and addiction issues, and others with complex needs. The CHCs served diverse communities but all included a large proportion of non-English and non-French speakers.

3.2 | Overview of study findings

Familiarity with the learning health system concept varied across participants where most individuals were somewhat familiar with it, some were very familiar with it and a few described that this was new to them.

We observed three foundational elements necessary for the development of a learning health system within primary care: shared organizational goals and culture, data quality and resources. Building on this foundation, people are needed to drive the learning health system forward, and this is conditional on their level of motivation or engagement.

3.3 | Foundational elements

3.3.1 | Shared organizational goals and culture

Most participants had positive opinions about the Alliance and their CHC moving in the direction of a learning health system and agreed that learning and improving are already part of their organizational culture: 'I think the Alliance is very excited about the opportunity to be a learning health system because of the way we already operate, our focus on data, and our focus on improving chronic disease management' (Executive Director 1). However, there was general agreement that the Alliance still has work to do to become a more established learning health system: 'I think there are components that are set up [and] there's the opportunity for the learning system. I don't think that's happening. I don't think it's that real-time, like the quick feedback' (Manager 1).

Participants described that some CHCs were functioning more as a learning health system than others and had the personnel and resources to make it happen:

I think some centres have built [quality improvement] into their culture more and ... they've really built that into their workflows and, maximized the use of their experts in data, and have clinical people and champions that do it. So I think there's a range. (Data Support 1)

Participants also expressed how this variability in adoption of a learning health system across the CHCs was a limiting factor for the Alliance as a whole:

I think that as we look at the Alliance moving towards being a learning health system what that means is that all of our members are functioning as a learning health system and that's what makes us one. (Data Support 2)

Finally, there were questions about what being a learning health system means and what the next steps



would be: 'How do we take this thing that everybody seems really keen about and agrees upon into something that 'Okay, now you have to sign on the dotted line that you really support these things?' (Data Support 3)

3.3.2 | Data quality

Participants recognized that good data quality is necessary for a learning health system: 'It depends on the quality of the information that it's pulling and how much we can base our decisions on that' (HCP 1).

Most participants thought that the ability of the data and EMR systems to answer their questions needed to be improved: 'I would say that our data is flawed... Like there's lots of information it just will not pull accurately and every time I get handed data, it's always with a provision' (Executive Director 2). This problem was mostly a result of poor EMR functionality: 'But we're trying to kind of capture data to fit what the tool is offering to us as opposed to how we would want to capture the data that we want to' (Manager 2). EMR transitions were also part of the problem: 'I think the data quality has suffered over the years, we've had two EMR transitions in a short period of time, and I think it's been pretty burdensome on the providers' (Data Support 1). Inconsistent data entry further contributed to data quality issues: 'Everybody has a different way of documenting. Some people simply tick the box hypertension and some people write a novel about hypertension which impacts the ability to pull the data on those types of things' (Executive Director 1).

Some participants expressed frustrations with extracting data: 'The way in which data is pulled now, it requires many steps from the user and I think that that has big impacts on what we're going to get out' (HCP 2). Some participants felt that data extraction was more of an issue than data quality: 'What I find with EMRs is that sometimes the data that's actually in the EMR might be great, but the ability to pull it out is pretty crappy' (Manager 3).

There was also agreement among most participants that data are being analyzed, but it is not being used to inform or change practice: 'In our meetings they will show statistics about different things, patients that we are seeing, but I wouldn't say there is any practice changing' (HCP 3). A limitation to using the data to change practice is that the data are not real-time:

There's not a rapid enough turnaround for it to actually be used in real time. And so that's maybe a gap... Like we have some access to good data. It's just that maybe it's still not rapid turnaround enough for me and not focused enough. (Executive Director 3)

3.3.3 | Resources

The majority of participants explained that limited time for frontline providers to focus on data entry, quality improvement or other initiatives to support a learning health system was a barrier:

Sometimes we have a great idea behind the scenes how we can improve something and then it's a lot of new steps that [front-line staff] have to learn. And that leads to resistance because they're already working at 100 percent, and have a very busy job. (Data Support 3)

Some participants have expressed how their CHC has provided protected time for providers to do quality improvement or research but it remains insufficient: 'I know that two of our physicians who are doing research on top of what they're doing, we've tried to carve out time but by no means have we carved out all of the time they need' (Manager 3). Other participants discussed ways that they prioritize initiatives: 'So, as a team, we'll talk about what we feel will have the most impact for clients and for our work and we'll maybe set a timeline and we'll determine where to start' (HCP 2). However, participants at other CHCs described that the mandatory reporting targets for their funder take priority and do not leave much time to focus on other quality improvement or learning activities. This often led to frustration: 'I'll be honest, it's a struggle... "I can't ask our staff to do one more thing"' (Manager 4). Another barrier expressed by participants was the lack of dedicated funding: 'We would have to pull that out of our base budget... Our base budget hasn't been increased for a long, long time' (Executive Director 2).

3.4 | Driving forces

3.4.1 | People

Participants described how their leadership (managers and Executive Directors) are very supportive and excited about using data for quality improvement or other learning health initiatives: 'I love pulling reports—I'm weird that way—and I love looking at what I'm seeing, what the trending is telling us' (Manager 3).

There were mixed opinions on whether staff are eager to participate in quality improvement or other related activities. Some participants described how the staff and providers at their site are very eager: 'They're interested in the data, they're interested in using the data, and I think if anything the providers and the staff were probably ready for this years ago, they don't want to be collecting data for collecting data sake' (Data Support 2). Other participants described more resistance among some staff: 'Also, it depends on individual staff personalities. Because when you start talking about data it's not always people's interest' (HCP 1). This was an issue,

particularly among providers: 'We've booked a load of learning sessions [for providers] and have struggled with our show rate. We've had only a handful of people show up for things, even though the team has said we need this' (HCP 4).

Participants generally agreed that having someone in a dedicated data support role is an enabler to having better quality data and being able to do more quality improvement work: 'We rely on our quality decision support specialist. She does all the training. As she goes in to pull different things, she might notice something and she's immediately addressing the things with her team' (Executive Director 4). CHCs without data support staff noted the absence: 'I think the first thing that we'd need would be a [data management coordinator]. So we don't have that now. We have a very lean machine rolling here, but I really think that that would be important' (HCP 5).

3.4.2 | Motivation

Participants identified different reasons why some staff are more motivated to engage in quality improvement or learning health initiatives than others. The most prevalent motivation was that people want to improve client care and efficiency in the workflow: 'Is this truly going to impact patient care? Is it going to impact workload? Is it going to make things easier for patients and us?' (HCP 6).

Participants expressed that people are more motivated when ideas for quality improvement come from front-line staff rather than from management or funders:

I think things that come from the bottom-up is the stuff that gets people the most excited. I can come in and say [management] want us to capture X, Y, and Z, and it feels like another job. But if somebody [on the frontline team] says, 'I'm really curious about this clinical issue,' and everybody gets excited, that doesn't feel like another job. (Executive Director 3)

For initiatives that come from management or funders some participants mentioned that understanding why they are collecting data is a strong motivational factor:

This is the reason why we want to do it because we are looking really bad right now in this one area and we think we can really improve and then after maybe half a year... it has improved, your work has paid off. I think it's a big deal in getting them and keeping them onboard. (Data Support 3).

Some participants described using creative strategies to engage the staff in quality improvement and learning activities, including competitions: 'At one point we even divided everyone into teams, and did team dashboards, and actually broke it down per team, and they got really competitive, it was really fun' (Manager 3). Another strategy was using peer pressure:

For me the main thing was getting buy-in, like when we made it visible who was participating and who wasn't it also created a bit of peer pressure and a bit of shame for people who didn't engage and, we were able to get everyone engaged, which was really nice. (HCP 2)

4 | DISCUSSION

Through the perspectives of the Alliance stakeholders, we identified the strengths and limitations of the Alliance functioning as a learning health system. This information can be used by the Alliance and other similar primary care organizations to help develop or strengthen their learning health system. The main strength that was described is the culture of optimism around developing a learning health system among the staff and leadership at the Alliance. Based on experiences from large integrated healthcare systems, including the Veterans Health Administration and Geisinger Health System, having a strong culture for research and quality improvement is instrumental for the successful development of a learning health system.^{18,20}

Our findings suggest that having an integrated data platform is necessary but not sufficient for a primary care organization to develop into a learning health system. For instance, the participants described issues with data access and quality, mostly due to improper or inconsistent data entry. Similarly, other researchers have also described challenges using current EMRs for research or quality improvement within a learning health system,^{21,22} and for developing clinical prediction models using primary care EMR data.²³ Participants also described discrepancies between the most efficient methods to enter data, such as using free text, and the ideal format to retrieve it for analysis where checkboxes are more useful. To ensure consistent and accurate data entry, workflows should be seamless and require little to no extra work for the front-line staff.^{24–26} An example from the Veteran's Health Administration demonstrates how pragmatic randomized trials to test new evidence-based care practices can be conducted at the point of care in ways that do not need providers to enter any additional information.²² The participants also described that the data is not extracted and analyzed in near real-time, which is a further requirement for data to be effectively used in a learning health system.¹⁷ Our study illustrates some of the data challenges, in particular with EMR data, that other primary care organizations may anticipate when planning a learning health system.

As for resources, participants observed inconsistent access to data support staff across the different CHCs, which was a barrier to functioning as a learning health system for locations without this support and was an enabler for locations that did have data support staff. Furthermore, both time and funding were identified as limiting factors. Dedicated funding could allow for data support staff at each location and to protect more time for healthcare providers to be involved in learning health initiatives. There is a lack of literature describing motivating factors for engagement with a learning health system. In our study we found that the participants' drive to help improve care and workflow, focusing on initiatives that are of interest



to them (priorities driven from the bottom up), understanding why they are collecting data or doing quality improvement, and using incentives such as competition or peer pressure were all motivators for engagement with this primary care learning health system. While participants mostly described good engagement with staff, providers have been more difficult to engage; barriers besides lack of time should be explored. A study among healthcare providers in Australia found that the most important component to engage in quality improvement is the role of leadership in empowering providers.²⁷ Resources could also be used to have people champion or motivate providers to be more engaged in the learning health system. Some integrated healthcare learning organizations have found success in using mentorship models between experienced clinician investigators and more junior ones,^{28,29} whereas other organizations have focused on education or training for primary care providers to encourage more participation in learning health system initiatives.³⁰⁻³² Similar organizations planning a learning health system should ensure that there are adequate resources available, particularly access to data support staff and protected time for providers to participate. We recommend that organizations should also have a plan for selecting, engaging and motivating providers to strengthen the learning health system.

4.1 | Strengths and limitations

To ensure credibility and confirmability of our findings we used investigator triangulation by having two interviewers and up to three coders for the analysis. As the third coder and an investigator who was not an interviewer, J. B. B. offered a more objective view of the findings. We used maximum variation purposeful sampling to ensure the transferability of our study results to all CHCs in Ontario. Although we only interviewed participants from six CHCs, they were diverse and reflected the majority of CHCs based on location (rural, urban and suburban areas) and populations served. Part of our maximum variation sampling was to include participants in different roles, but some individuals were underrepresented including allied health professionals, nurses and family physicians. Further, we did not interview any patients. As CHCs serve a more disadvantaged population and are organized differently than other reimbursement and delivery models for primary care in Ontario, our study results may not be fully transferable outside of the CHCs.

5 | CONCLUSION

This is the first study to identify the key components needed to establish a learning health system within primary care. Our study suggests that the main enablers include a positive organizational culture and supportive leadership, an EMR where data can be seamlessly entered and extracted in real-time, motivated providers and staff with the capacity to efficiently interact with the learning health system, and access to resources including dedicated data

support personnel. We hope that other primary care organizations might find this description of the Alliance's experience helps them to move forward with their own learning health system initiatives.

AUTHOR CONTRIBUTIONS

Jennifer Rayner and Merrick Zwarenstein were responsible for the study conception. Jennifer Rayner, Cathy Thorpe and Danielle M. Nash were responsible for the recruitment and data collection. Danielle M. Nash, Cathy Thorpe and Judith Belle Brown conducted the analysis and interpretation of the findings. Danielle M. Nash drafted the initial manuscript, which was reviewed, revised and approved by all authors.

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CONFLICT OF INTEREST

Jennifer Rayner is an employee of the Alliance for Healthier Communities. The other authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data sets generated and analyzed during the current study are available from the corresponding author on reasonable request.

ETHICS STATEMENT

We received ethics approval for this study from the Western University Research Ethics Board (Project ID: 112799). Written informed consent from the participants was obtained for study participation. We confirm that all methods were carried out in accordance with relevant guidelines and regulations.

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