

Strengthening



IN ONTARIO'S
PUBLIC HEALTH UNITS

A LOCALLY DRIVEN COLLABORATIVE PROJECT
2016-2017

Enabling continuous quality
improvement in public health:
A scoping review

JULY 2017

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Recommended citation

Law, M. P., Berry, A., Beehler, J., Thompson, S., Jibb, S., Hunter, D., & Pilato, K. & the CQI LDCP Team (2017). *Strengthening Continuous Quality Improvement in Ontario's Public Health Units: A Scoping Review*. Fort Frances, Ontario, Canada.

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The CQI LDCP Team would like to thank Public Health Ontario (PHO) for its support of this project. The team gratefully acknowledges funding received from PHO through the Locally Driven Collaborative Projects program. The views expressed in this publication are the views of the project team, and do not necessarily reflect those of Public Health Ontario.

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Executive Summary

Continuous quality improvement (CQI) has been discussed in Ontario public health units for over a decade. There has been limited guidance on how to operationalize CQI in public health and only a few research projects focused on the Ontario context [1-3]. Individual public health units (PHUs) have developed innovative ways to do this work based on specific organizational structure, staffing and understanding of CQI. This means that CQI in public health units looks different across the province making it difficult to share information, learn from each other and develop common standards of practice.

The Locally Driven Collaborative Project (LDCP) Strengthening Continuous Quality Improvement (CQI) in Ontario's Public Health Units (project name: CQI LDCP) was established to examine and enhance the current state of continuous quality improvement within Ontario's public health units. For the purposes of this research project, continuous quality improvement (CQI) is defined as an overarching management philosophy or framework within the organization that drives the daily work activities of all employees. Quality improvement (QI) is defined as the deliberate and defined processes and methods that are used to continuously develop, design, evaluate and change practices and programs to ensure that they are of high quality [4].

The CQI LDCP team is working collaboratively to answer the research question, "How can systematic continuous quality improvement be strengthened within Ontario's public health units?"

This research project included two main components: a scoping review of the literature and the implementation of a QI Maturity Tool – Modified Ontario Version. Results regarding the QI Maturity Tool – Modified Ontario Version undertaken in local health units are reported separately. This report summarizes the results of the scoping review.

The search strategy question used for the scoping review was:

What critical elements (organizational structures, systems, processes and activities as well as individual capabilities) are needed to create, support and sustain CQI in public health?

Methods

The scoping review methodology used for this research project included six stages: 1. identifying the research question; 2. identifying relevant studies; 3. study selection; 4. data extraction; 5. collating, summarizing and reporting the results; and 6. consultation [5-9].

Results

Fifteen enablers for implementing CQI across five domains emerged from the literature.

The literature was mostly descriptive in nature. The review team examined the comments from the authors in relation to their findings, views and conclusions to identify the domains of a CQI framework that would enable quality improvement (QI) practices to take place. The insights of the original authors are valuable but also have inherent issues of hindsight bias that should be considered.

Research reviewed from public health settings demonstrated similarities in the domains and enablers when examined together with research from the other health sectors. The major difference for the public health sector are the challenges in applying QI practices to the longer-term preventive and health promotion programs in the public health setting. That said, the literature strongly pointed to key strategies that were important to the implementation of a CQI framework which are summarized as:

1. CQI is supported by an organizational culture that is innovative and non-punitive, and where QI efforts are seen to be aligned with, and reflected in, the agency's mission and values.
2. Organizational supports are needed to help enable QI to occur in the organization. These include training and education for staff; human resources policies and practice that support QI; funding and resources to enable QI work; and ensuring that teams engaged in QI practices are multidisciplinary in nature.
3. The support of senior leadership is necessary for CQI to spread and be sustained. Other formal and informal leaders at all levels of the agency can also support and enhance QI efforts.
4. Robust, reliable and available data in real time is an important enabler to implementing and sustaining CQI work. Existing data systems can be leveraged to support QI activities.
5. External supports such as QI collaboratives, accreditation/certification, and external funding enhance the use and effectiveness of QI.

Conclusions

This study has identified key enablers of the CQI management approach in five domains that together contribute to implementation of QI in health-related organizations and may be applicable in the public health setting in Ontario.

Next Steps

Our goal is to advance CQI within and across Ontario's health units with evidence-based applied research grounded in the experience and perspectives of those working in the field of public health.

We will consult with health unit leaders and staff, system stakeholders, researchers and other decision makers in relation to the results of these research efforts to create an evidence-informed applied research project that will help to further propel CQI work in PHUs in Ontario.

Introduction

Continuous quality improvement (CQI) has been discussed in Ontario public health units for over a decade. However, there has been limited guidance on how to operationalize CQI in public health and only a few projects focused on the Ontario context [1-3]. The importance of CQI as a part of performance management was recognized in 2006 by the Capacity Review Committee [10] and was included as a required activity for public health units [10]. CQI will be included in the new Standards for Public Health Programs and Services coming into effect January 1, 2018. Understanding CQI management principles and practices varies among public health units in Ontario. Individual public health units have developed innovative ways to do this work based on specific organizational structures, staffing and understanding of CQI. This means that CQI in public health units looks different across the province making it difficult to share information, learn from each other and develop common standards of practice.

The Locally Driven Collaborative Project (LDCP) Strengthening Continuous Quality Improvement in Ontario's Public Health Units (project name: CQI LDCP) was established to examine and enhance the current state of continuous quality improvement within Ontario's public health units. A team of representatives from 19 public health units has been involved in the development and implementation of the project. The CQI LDCP was led (to January 2017) by Principal Investigators Alex Berry from Northwestern Health Unit and Meighan Finlay from Wellington-Dufferin-Guelph Public Health and Academic Research Lead Dr. Madelyn Law from Brock University. The CQI LDCP was funded by Public Health Ontario (PHO) and supported by a project coordinator at Northwestern Health Unit and a research assistant at Brock University. Additional funding was also received from the Canadian Institutes of Health Research to support and enhance knowledge exchange activities.

The project research question was:

How can systematic continuous quality improvement be strengthened within Ontario's Public Health Units?

Specific research objectives for this one-year LDCP were identified as follows:

1. Identify the drivers and attributes of CQI that are applicable and transferable to Ontario's public health sector.
2. Describe the current state of CQI in and across Ontario's public health units.

The research project included two main components: a scoping review of the literature and the implementation of a Quality Improvement Maturity Tool – Modified Ontario Version. Results of the QI Maturity Tool – Modified Ontario Version undertaken in local health units are reported separately. This report summarizes the results of the scoping review.

The search strategy question used for the scoping review was:

What critical elements (organizational structures, systems, processes and activities as well as individual capabilities) are needed to create, support and sustain CQI in public health?

Defining Continuous Quality Improvement and Quality Improvement

For the purposes of this research project, continuous quality improvement (CQI) is defined as an overarching management philosophy or framework within the organization that drives the daily work activities of all employees. Quality Improvement (QI) is defined as the deliberate and defined processes and methods that are used to continuously develop, design, evaluate and change practices and programs to ensure that they are of high quality [4].

The Ministry of Health and Long-Term Care (MOHLTC) defined CQI as:

a management philosophy that focuses on processes and systems rather than the performance of individuals. It uses objective data to analyze and continually improve those processes and address the needs of both internal and external customers. It links data collection, reporting, monitoring and learning and makes them the cornerstones of an ongoing, quality improvement cycle . . . [10]

Further, in a paper focused on CQI in health promotion, CQI has been defined as “a comprehensive management philosophy that focuses on improvement by applying scientific methods to gain knowledge and control over variation in work processes” [11]. These definitions allow for the understanding that CQI is an overarching philosophy or framework within the organization that drives the daily work activities of all employees. Hence, the management philosophy of CQI then supports the implementation of quality improvement practice.

Quality improvement (QI) practice is the use of quality improvement methods and tools (e.g., Lean, Six Sigma, Plan-Do-Study-Act) to allow for a deliberate and defined process to make change. It includes the specific instances of developing, testing, or implementing new interventions, best practices, different workflows and/or new programs “to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community” [12, 13]

This project was interested in understanding the domains that are essential within a CQI management approach and the associated enablers for QI practice (i.e., QI projects, QI initiatives, QI activities) to be implemented and sustained successfully.

The Focus on Continuous Quality Improvement in Public Health

In Ontario, health services (e.g., hospitals, primary care, community health centres, long-term care) are mandated to engage in several activities with the goal of improving quality in the healthcare sector. These include the submissions of annual quality improvement plans, patient engagement strategies and executive compensation linked to performance [14]. Although quality-related practices in Ontario public health units are not mandated to the same extent, it has been noted that adopting a CQI management framework may improve public health practice [13]. New Standards for Public Health Programs and Services coming into effect January 1, 2018 will include a section on quality and transparency [10]. In this section, the focus is to ensure a culture of quality and continuous organizational self-improvement. Although still in draft form, these new requirements will influence the operationalization of QI practice in Ontario public health units. There is a growing trend to develop, adapt and implement QI methods and tools in public health settings, specifically in the United States of America (USA) [13, 15, 16]. In the USA, much of this work stems from the initiatives and guidance from the National Public Health Improvement Initiative (NPHII) through the Centers for Disease Control and Prevention which funds local, territorial and tribal public health agencies to make improvements to their services (<https://www.cdc.gov/stltpublichealth/nphii/>). One of the goals of NPHII is to help support health departments in their accreditation readiness. These organizations have strategies to report, track and share information on promising practices across a network of agencies to help maximize their improvement efforts.

Capitalizing on this energy and focusing on the CQI management framework in other industries, health sectors and in other countries, CQI has also become a focal point in Ontario public health units. Therefore, engaging in a scoping review was perceived as a first step to create a collective understanding of CQI from the literature that will help strengthen the implementation and sustainability of a CQI management approach in Ontario public health units.

Methods

A scoping review enables the research team to summarize and disseminate research findings by identifying the type of evidence, study designs and high-level findings that are found in existing academic and grey literature [5]. A Scoping Review Working Group (SRWG) of 12 people was established in January 2016, including two public health librarians. This team worked collaboratively throughout all stages of the project.

The scoping review methodology used for this research project included six stages: identifying the research question; identifying relevant studies; study selection; data extraction; collating, summarizing and reporting the results; and stakeholder consultation [5-9]. Each of these stages is outlined below with a description of the tasks that were undertaken in each step during this project.

Stage 1 – Identify the scoping review question

The scoping review question was identified to facilitate the identification of drivers and attributes of CQI in public health settings. The question, as included in the LDCP application, was:

What critical elements (organizational structures, systems, processes and activities as well as individual capabilities) are needed to create, support and sustain CQI in public health?

Stage 2 – Identify the relevant literature

The Scoping Review Working Group included two public health librarians who facilitated the development and implementation of a search strategy which included both peer-reviewed and grey literature (see Appendix A: Search Strategy). The inclusion and exclusion criteria as developed by the review team is outlined in Table 1.

Table 1 – Inclusion and Exclusion criteria for the scoping review		
	Inclusion	Exclusion
Focus of the study	a) Describes how CQI has been implemented in the public health sector “OR” b) Provides research or a case study regarding implementation of CQI efforts in the public health sector “OR” c) Describes structures and contextual factors related to the implementation of CQI in the public health sector (i.e., factors that are core to QI successes)	
Methods	Clear overview of the methods used in relation to research and/or CQI tools and methodologies	Insufficient information to support the understanding of the drivers or attributes of CQI
Language	English	Non-English
Publication Types	Peer reviewed literature, grey literature	Conference posters and abstracts, newspaper articles, opinion pieces, letters
Publication Years	2009 – current	Before 2009
Country	North America, Australia, New Zealand, United Kingdom	
Focus	Human Studies	Animal Studies

The scoping review included a three-step search process:

1. A preliminary search was conducted in April 2015. The first search included a scan of Medline and Health Business Elite databases which was done to inform the development of the research proposal. Common indexed language was also collated at that time. A similar procedure was repeated for grey literature in June 2015. The SRWG further refined and standardized identified indexed language by approving a list of Medical Subject Heading definitions in November 2015.
2. A second search was executed in January 2016 and translated across approved databases. A follow-up search was completed in December 2016 to capture articles published between January 2016 and December 2016 and expanded to include research from the United Kingdom as they have been identified as leaders in quality and change in health care systems.
3. A third search in the fall of 2016 identified major journals which were hand searched for relevant research focused on CQI in public health.

The associated date range (i.e., 2009+) was chosen to ensure a manageable set of data that would allow for the identification of CQI work in public health. It was also in 2009 that a report was published with a consensus statement about public health quality dimensions [17] that helped to galvanize CQI work in public health. The countries included in the search were chosen based on the similarities in the demographics in the populations that would be found in these countries (i.e., multi-cultural, age demographics, similar chronic conditions) and due to the increasing focus that these countries have placed on improving the quality of their health systems.

When the search was conducted we did attempt to limit our search to “public health”. However, as we reviewed the literature that was retrieved it was evident that “public health” was used differently and had various connotations across the literature, hence eliciting information across numerous health related sectors. The decision was made to include all of the literature given that a) we did not want to miss something that was clearly related to public health as we understand public health work to be in the Ontario context and b) there were relatively few articles specific to public health settings that were comparable to PHUs in Ontario. Therefore, the team felt that we would be able to learn from other health settings about their efforts to implement CQI that would help to inform PHUs through this scoping review.

Stage 3 – Study selection

Retrieved articles were filtered using a multi-stage screening process by SRWG members. The Level 1 screen was a review of article titles and abstracts by individual team members for compliance with criteria of a) English, b) publication year, c) health field, and d) is CQI or QI mentioned in the abstract. A team calibration was done to test the inclusion/exclusion criteria and to ensure that all team members were applying the criteria consistently prior to the initial screen.

Articles that passed the first screen were included in a Level 2 in-depth full text screening based on the criteria in the inclusion/exclusion table. Criteria included a) is the implementation and/or sustainability of quality improvement discussed and b) does the article describe factors related to the process of QI (i.e., structure, systems, processes, activities, individual capabilities, contextual factors related to implementation). Another calibration meeting between reviewers occurred before the final full text screening. Any discrepancy between reviewers as a result of the calibration meeting was discussed and a decision was made through consensus. Each article was reviewed by two team members, and marked as included, excluded, or unsure. Results were discussed, and agreed upon, in small group meetings with Dr. Law, Academic Lead.

Stage 4 – Data extraction

A data extraction form was developed by the SRWG based on the general areas of interest for the project (see Appendix B: Data Extraction Form). Five individuals from the SRWG were responsible for reading full text articles and populating the tables. As a calibration exercise, group members were given the same five articles and asked to fill in the tables. A meeting with the SRWG took place to ensure the team was clear on the information to be included in each of the columns of the data extraction tool. Data was extracted from articles which met Level 2 criteria. The data extraction process resulted in a third and final exclusion of selected articles from Level 2.

Stage 5 – Collate and summarize results

The completed data extraction tables were distributed to all members of the SRWG and preliminary themes were identified. The SRWG agreed to use these themes within the table as the starting point for a stakeholder consultation meeting which included all members of the LDCP Core Project Team.

Stage 6 - Stakeholder consultation

All members of the LDCP Core Project Team were invited to a structured, face-to-face consultation workshop in October 2016. Participants were assigned to work on two of the six themes identified by the SRWG. Copies of the data extraction tables and full text articles were made available. Participants worked in small and large groups to refine the themes and identify related key learnings from the literature.

Dr. Law used the results of the consultation to complete the second draft of the synthesis of the literature. This technique is akin to the constant comparative analysis approach using an iterative process to identify common characteristics within the literature. This process entails a deductive approach with large-meaning units of information which are grouped together under overarching categories with sub-themes. The data analysis and theme refinement followed an iterative process between researcher (Dr. Law) and the core team of public health professionals, where the team was provided with the opportunity to review and comment on drafted versions of the synthesis. As well, a smaller core group was involved in the writing of the final document. This level of engagement allowed for discussions about the topics and the relevance to practice, while also maintaining a robust research approach.

Results

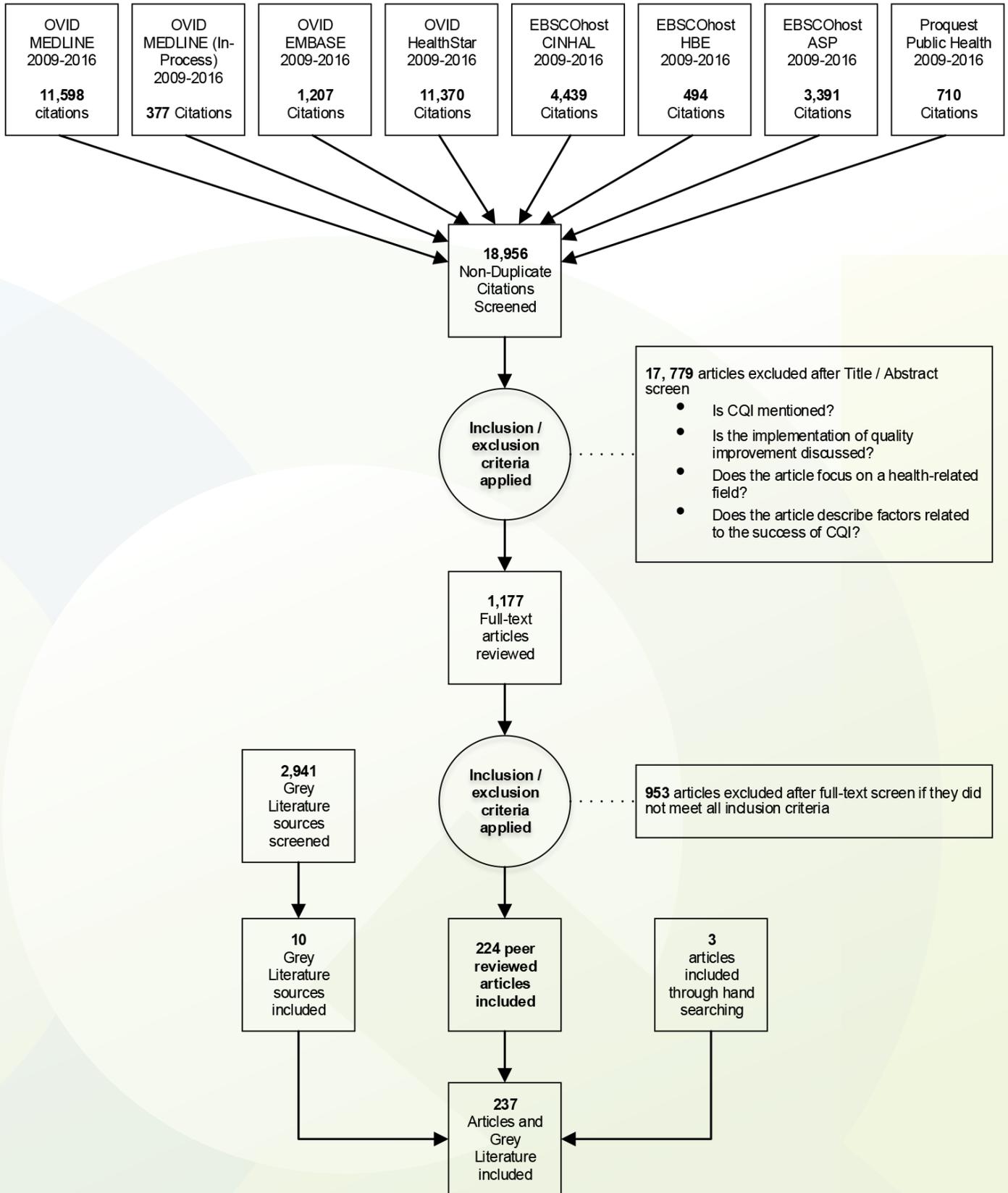
Description of the research

The final search returned 18,956 articles. After the Level 1 screening of the title and abstract was completed 1,177 articles remained. The Level 2 screening resulted in a total of 224 peer-reviewed articles that are included in this review. Grey literature was reviewed as well, which resulted in 10 included documents. Further hand searching of the key journals uncovered three additional articles. Therefore, the total pieces of peer-reviewed, grey literature and hand searched articles included in the review was 237.

Of the 224 peer-reviewed articles included for the project, most (N = 181) were research articles of which the majority were descriptive (N = 171). There was a broad mix of methodologies used in these articles from mixed methods (N=50), pilot studies (N=17), qualitative (N=47), quantitative (N=79) and reviews (N=8). Not surprisingly, most of the articles were from the acute care context (N=116) with 24 articles identified from public health settings. Many of the studies incorporated various health professionals as the participants in their projects (N=77) with 70 strictly from front-line staff. Within the countries that we examined, most of the work in this area was being conducted in the USA (N = 125). Of the articles reviewed, 103 of the articles reflected a macro level of reporting, which means that the results were reflective of more than one organizations' results or a collective perspective of QI within a collaborative.

It is important to note that the acute care sector has a longer history of implementing CQI, and arguably a more deeply engrained understanding of CQI management approaches and related use of QI practice. However, given that we are interested in the idea of creating, supporting and sustaining CQI, this was not perceived to be a limitation, but more so an opportunity to learn and reflect on how this may look in a public health context. See Figure 1: Overview Flowchart for the Scoping Review, next page.

Overview Flowchart for the Scoping Review



Description of the themes

Five main domains emerged from the literature pertaining to the critical elements of implementing CQI. Across these domains a total of 15 key enablers were identified. When considering and reviewing these enablers it is important to acknowledge these structures, systems, characteristics, activities or processes co-exist and interplay with each other to support or contribute to the CQI framework. No single enabler is necessary and/or sufficient to create a culture of CQI; rather a multifaceted approach to CQI should be considered. These domains and enablers are summarized in Table 2 below. Throughout the document the ‘domains’ and the associated ‘enablers’ are discussed with a brief description and the references that align to the statements. This is followed by a section entitled “What we are still wondering about” which highlights key questions that the CQI LDCP team has identified as areas of interest for future work.

Table 2: Summary of Domains and Enablers

Domain	Enablers	Description
Domain 1: Organizational culture	Innovative, non- punitive culture	Leaders must create and support an environment that focuses on learning, risk taking and innovation that will in turn spark engagement in QI practice. The organizational culture should accept failure as a learning opportunity and provide an environment that is non-punitive.
	Strategically Aligned	CQI frameworks and associated QI practices that are aligned to the mission/vision of an organization support a culture of CQI.
Domain 2: Organizational Structure	Training and education	The type and focus of training varies without consensus on the most optimal type. Formats include workshops, just-in-time training, tailored site/project specific training and teleconference/web-based training. Content include Lean, Kaizen events, Plan-Do-Study-Act (PDSA), Model for Improvement and other hybrid approaches.
	Human Resources	Hiring practices, employee performance and job descriptions that integrate QI practice requirements support a successful organizational structure. Challenges with integrating QI are linked to the impact of staff turnover and absences that create gaps in knowledge for QI practice.
	Internal Funding and Resources	Funding and resources are essential to support current staff in QI pursuits which include funding new QI specialist hires or resources required for interventions.
	Multidisciplinary teams	Multidisciplinary teams enable the implementation of QI practice. These teams are often described as QI teams, committees, or working groups that focus on a QI project or initiative over time. It is important to include multidisciplinary representation on the QI team from all the staffing groups that will be “touched” by organizational changes.
Domain 3: Leadership	Senior Leadership	The literature supports senior leadership as a driving force for integrating CQI values and behaviors within an organization. This is done by developing an understanding of the basics of QI, aligning a CQI framework within organizational priorities, and visibly supporting the CQI approach.

Table 2: Summary of Domains and Enablers

	Middle Management	Middle managers encourage the implementation of QI practices through coaching, mentoring and motivating staff to participate in QI activities. Middle management are also responsible to examine workflows and support the allocation of time to ensure staff can engage in QI activities.
	QI facilitators	A QI facilitator or coach is an individual who is a staff expert, external consultant, or an engaged front-line worker with training in QI. They have expertise in QI and help to structure, implement and evaluate QI projects.
	Front-line Leaders	Front-line leaders, or front-line champions are informal leaders who engage in and support QI practices in their day-to-day work with peer colleagues. These individuals are seen to have expertise or interest in QI and help to drive QI practices.
Domain 4: Data	Characteristics of the Data	QI requires robust and real-time data management infrastructures with trusted metrics to promote and drive QI activities.
	Leveraging data	Leveraging existing structures and personnel to collect, report, use and share data will help to drive and sustain QI practices.
Domain 5: External Supports	Quality Improvement Collaboratives	Regional or national QI collaboratives bring individuals from different organizations together around a specific topic and allow for knowledge sharing and collective training to support QI work.
	Accreditation	Findings related to accreditation and QI practice vary. Select reports indicate accreditation helps to push QI forward and motivates staff to engage in QI. Others report accreditation helps build a learning community and promotes information exchange and learning across settings.
	Funding and Resources	Many organizations seek out external funding to support the implementation of their QI endeavors. These funding agencies are often linked with QI collaboratives or funding through local governments to support CQI training activities.

Domain 1: Organizational Culture

The literature discusses the importance of having an organizational culture that is supportive of CQI [18-25]. Organizational culture is defined as a pattern of shared basic assumptions that a group learns as it solves problems of external adaptation and internal integration [26]. There are three levels of organizational culture including artifacts (visual cues in the environment about the culture), beliefs and values, and basic underlying assumptions (unconscious taken for granted beliefs), all of which drive the behaviors of staff. A culture of CQI was characterized as one that is innovative and non-punitive and places an emphasis on a CQI management approach that supports the overall mission of the organization.

Enabler - Innovative, non-punitive culture: According to the literature leaders must create and support an environment that focuses on learning, risk taking and innovation that will in turn spark engagement in QI activities. The organizational culture should accept failure as a learning opportunity and provide an environment that is non-punitive.

- Leaders need to create a safe space for staff to learn and share [27]. An environment where staff feel as though they can offer thoughts, opinions and experiences is essential to engaging individuals in the practice of QI [28, 29].
- CQI coaches and facilitators help to create an environment for staff to move from a blame culture to one which openly discusses problems [30]. A CQI environment that fosters discussion rather than blame is important to drive QI practice [31].
- Individuals in a non-punitive culture feel empowered to take charge of their practice and make changes that contribute to overall improvement efforts [32]. This aligns to the notion that organizations more amenable to change are more successful in the implementation of QI practices [33].
- Organizations with an open culture (i.e., innovative and learning focus) attempt more interventions within their QI work [34].
- The focus on a culture of accountability where staff are supported to discuss their QI projects and celebrate successes of the team is important to ensure buy-in and engagement of staff [35].

Enabler - Strategically Aligned: CQI frameworks and associated QI practices that are aligned to the mission/vision of an organization support a culture of CQI.

- Individuals require time to reflect on the values and mission of the organization to understand how their QI practices are connected to the organization's focus. This helps to motivate and gain buy-in from staff to enhance in QI practices [36-38].
- Clear articulation to all staff regarding the organization's vision and strategy for improving quality allows staff to connect their daily work to the overarching organization approach [39-41]. Including CQI in the strategic direction of an organization ensures it is a priority area for senior management and all staff [42, 43].
- Organizational goals, resource allocation and actions must align with QI practice [22, 44-47]. This is reflected in a vision, mission and value statement for the organization related to the CQI management framework [47].
- Organizational incentives for QI are also a way to foster a culture of CQI (e.g., QI project award program) [45, 48]. This has been done through the alignment of QI performance goals and incentive programs [49].
- All QI practices need to be considered within the broader realignment or reorganization of workflow for staff [50, 51], which would allow staff time to engage in QI practices [52, 53].
- Organizational preparedness for engaging in QI practices was outlined as key to the successful implementation of QI projects [54-56].

What we are still wondering about:

- Which actions or strategies employed by Ontario public health units have been successful in enhancing their cultural values and beliefs related to CQI?
- How will we know if our culture has changed to reflect an enhanced culture of CQI?

Domain 2: Organizational Support

Organizational supports are needed to help enable QI to occur in the organization. These include training and education for staff; human resource policies and practice that support QI; funding and resources to enable QI work; and ensuring that teams engaged in QI practices are multidisciplinary in nature.

Enabler - Training and education: The importance of training and education is discussed extensively in the literature [49, 53, 57-59]. There was no consensus on optimal type, focus and/or length of training. Numerous formats explored in the literature include workshops, just-in-time training, tailored site/project-specific training and teleconference/web-based training, while content includes Lean, Kaizen events, Plan-Do-Study-Act (PDSA), Model for Improvement and other hybrid type of approaches.

- Much of the literature emphasizes the importance of training for staff across the spectrum of the organization [42, 60] including management [61, 62]. However, select literature states there should be a brief amount of education provided to all staff with more extensive use of a QI expert to support specific targeted QI projects [63, 64].
- Training approaches range in length from half-day QI ‘Kick off’ days [23] to four 3-day training sessions [52]. Some training activities are supplemented by onsite QI expert visits to help facilitate QI projects, web-based training modules to support QI practice [65, 66], and/or monthly teleconferences to generate interest and foster collaboration [67]. Certain training incorporated pre-work and online modules before in-person sessions [68], while train-the-trainer formats use a peer model to engage staff in QI education [30, 69, 70]. Distance coaching and training were outlined to aid in front-line staff satisfaction with the QI process [15, 48, 71].
- Tailored approaches to training are paramount to engaging staff in appropriate and relevant QI methods and tools at specific points in QI projects [72-79].
- Collaborative and inter-professional training is beneficial for QI practice implementation when topics span various professional groups [74, 80-82].
- In relation to content that is incorporated into the training, it is important to identify the differences between QI and research projects to ensure clarity in approach and methods used [33]. A focus on self-efficacy and practice change are important to consider in the context of the QI practice to ensure that individuals feel supported and confident in their work [83-86]. Reflective practice is an important consideration through the learning and implementation of projects to understand what is, and is not, working well [36, 37, 87]. An understanding of the tools and appropriate application is also essential [88, 89].
- Site visits to other organizations to learn from local QI work provides learning opportunities for staff [90].
- Embedding QI training and learning into existing structures such as education days [91] and medical rounds [92], together with opportunities to share among interdisciplinary teams, helps train and educate staff [93].
- Training and educating clinicians leads to increased self-efficacy in relation to engaging in QI initiatives [81, 94-98].

Enabler - Human Resources: Hiring practices, employee performance and job descriptions that integrate QI practice requirements support a successful organizational structure. Challenges with integrating QI are linked to the impact of staff turnover and absences that create gaps in knowledge for QI practice.

- It is important to recruit and hire individuals with knowledge of the practice of QI (i.e., understanding of tools, methods, overarching CQI management framework). This has been shown to improve engagement in QI practice as well as adherence to quality indicators [31].
- Writing “quality” related activities into a job title or as part of job descriptions helps to further embed QI practice in to the work of staff and/or managers [99, 100].
- Turnover of staff increases the complexity of continuous training and challenges QI practice engagement [30, 101-103]. Casual staff are not always on site at all phases of the projects which may impact engagement and buy-in to ongoing changes [70, 103].

Enabler - Internal Funding and Resources: Funding and resources are essential to support current staff in QI pursuits which include funding new QI specialist hires or resources required for interventions.

- Funding is needed to ensure staff have protected time to engage in training for QI or in QI workgroups [42, 45, 63, 69, 104-106].
- Funding for tangible resources (i.e., new forms, technology, new hires) is required for ongoing QI work or for specific interventions [31, 37, 47, 50, 62, 107-110].
- Resource availability is the strongest and most consistent denominator for QI success [18]. Some studies outlined that the QI project reduced care costs [111].

Enabler - Multidisciplinary teams: Multidisciplinary teams enable the implementation of QI practice. These teams are often described as QI teams, committees, or working groups that focus on a QI project or initiative over time. It is important to include multidisciplinary representation on the QI team from all the staffing groups that will be “touched” by organizational changes.

- QI teams must be inter-professional and reflect all the staff members who will be impacted by the QI work and ultimately by the change that will occur because of the QI project [112-118]. One study outlined a QI committee formed both with patient families, as well as health professionals, to guide QI practice efforts [90].
- QI teams often work independently on specific quality related issues and update the managers or senior executives on initiatives [28, 119].
- Multidisciplinary teams aid in a faster redesign process that ensures changes are incorporated into the normal work flow of all the employees [120, 121]. They also help to create a sense of ownership in the change process [122-126].
- QI partnerships (i.e., multidisciplinary groups) contribute substantially to evidence-based design and implementation of QI practices [127, 128].

What we are still wondering about:

- Are QI teams/workgroups of selected individuals who work on specific QI projects the most appropriate approaches for QI practice, or should QI practice be inherently engrained in to everyone's work?
- What are the core skills, education and certifications that would be important to integrate in to job descriptions and job postings to ensure that staff are hired with appropriate QI skills? What would these look like for positions that are focused on QI (i.e., QI specialists) as compared to all other staff positions (i.e., public health nurses, health promoters, managers)? With the limited resources in public health, how have public health units determined where to prioritize resources for QI efforts?

Domain 3: Leadership

Leadership at all levels of the organization, from senior leadership to informal front-line leadership, is identified as necessary to support QI [49, 52, 67, 113, 129, 130]; however, the role or level of engagement, support and expertise varies. Leadership for QI can be formally structured at the management level (i.e., senior leaders, middle managers, QI facilitators) or integrated across the agency through front-line or key staff members (i.e., QI champions, front-line staff) [74, 131].

Enabler - Senior Leadership: The literature supports senior leadership as a driving force for integrating CQI values and behaviors within an organization. This is done by developing a personal understanding of the basics of QI practice, aligning a CQI framework within organizational priorities and visibly supporting the CQI approach.

- There is limited information regarding the content/approach of the training required for senior leaders; however, several articles noted the importance of senior leaders receiving some level of formalized external and/or internal training on CQI [42, 51, 61, 70, 104, 108, 122, 132]. It was also noted that senior leadership training is more common at organizations where there are higher levels of implementation and staff engagement in QI [61, 131, 132].
- Linking a senior leader to a quality metric for which they are responsible to oversee as part of their position helps foster a culture of CQI. [42, 45, 88]. As well, senior leaders linked as an executive sponsor (i.e., VP level senior executive) on specific QI projects helps to engage those individuals in the practice of QI [88]. Full buy-in and participation by senior leaders is critical to successful QI implementation and ensures QI projects remain a priority within the organization [33, 133-136].
- Senior leaders need to be engaged in the development of the CQI management framework from the beginning [68, 122, 132] to help appropriately identify and allocate resources. The role of senior leadership is to remove real or perceived barriers to engaging in QI practices, including those related to working across departments, disciplines or teams [3, 18, 53, 88]. Engaging with the board of directors (or other governance equivalent) increases understanding and support for the CQI framework, which can help ensure that resources are devoted to QI practice [42].

- Senior leaders should be visibly (to all other staff) engaged in or role modeling QI practice through their own professional activities and/or publicly supporting specific QI projects [56, 88, 90, 137-139].

Enabler - Middle Management: Middle managers encourage the implementation of QI practices through coaching, mentoring and motivating staff to participate in QI [140-144]. Middle management are also responsible to examine workflows and support the allocation of time to ensure staff can engage in QI activities [52, 106, 126].

Enabler - QI facilitators: A QI facilitator or coach is an individual who is a staff expert, external consultant, or an engaged front-line worker with training in QI. They have expertise in QI and help to structure, implement and evaluate QI projects. Designated QI facilitators can be important as organizational resources to those involved in QI work [87, 145-148] by providing staff engaging in QI activities with expertise, training, feedback on progress and/or general project management support [36, 101, 105, 149-151].

Enabler – Front-line Leaders: Front-line leaders, or front-line champions are informal leaders who engage in and support QI practices in their day-to-day work with peer colleagues. These individuals are seen to have expertise or interest in QI and help to drive QI practices.

- Champions are different from QI facilitators in that they are usually not designated staff positions with a primary responsibility to provide advice and support to others in their QI work [101, 152].
- Designating staff physicians (i.e., in hospitals) as champions helps to improve the adherence to quality indicators [31]. Residents were also identified as core champions helping to coordinate and implement QI activities [153].
- Champions have an important role in examining proposed changes and engaging and influencing staff in the implementation of specific types of changes [74, 122, 154].
- Champions can also contribute to the success of multi-disciplinary or cross-departmental QI practices [115, 152, 155, 156].
- QI projects need to be identified by front-line staff at the onset which includes identification of topics, teams, resource and training needs which will enable QI [146].

What we are still wondering about:

- What do senior leaders need to know (i.e., level of training or understanding, specific content) about CQI to support a culture of CQI across the organization? What is the best mode of delivery of this information at a senior management level?
- Are there benefits to having a QI facilitator role vs. a well-trained front-line staff?

Domain 4: Data

Robust, reliable and available data in real time is an important enabler to implementing and sustaining of QI work. This requires data infrastructure to allow for effective and accurate collection of data through the development of new or leveraging of existing systems. As well, timely analysis and communication of the results in turn supports and enables QI work to continue and be sustained in practice.

Enabler - Characteristics of the Data: QI requires robust and real-time data management infrastructures with trusted metrics to promote and drive QI activities.

- Standardized data collection is essential to ensure data tracked is reported consistently [25, 35, 66, 112, 155, 157-167]. Having clear and standardized baseline data provides for a foundation from which to develop, implement and track changes from the QI activities [168, 169].

- Committing to rigorous metrics [43, 64, 123, 155, 170-178] and ensuring an understanding of the quality of the data will in turn impact change [90, 157, 179-186].
- Accessing data in “real time” is essential for informing QI projects to make adjustment quickly [122, 187-189] and to support behavior change associated with the QI activities [65, 69, 88, 115, 174]. Automation in the collection and analysis is helpful in providing data in real time to support QI work as well as reduce workload [50, 53, 150, 174, 187, 190-198].
- Measures should be relevant to all involved (i.e., public, providers and decision makers) and linked to the priority areas of the organization [43, 199-201].

Enabler - Leveraging Data: Leveraging existing structures and personnel to collect, report, use and share data will help to drive and sustain QI practices.

- Dedicated data analysis support provides additional assurance that QI decision making is based on ongoing data collection within an organization [45, 202].
- When possible, adding a level of personalized performance data stimulates behavior change (i.e., physician performance data) [149, 189, 203, 204]. This was also seen in terms of local site performance data that was viewed as an enabler for QI [54].
- Sharing data within an organization highlights QI importance and sustains QI activities [155, 205-207].
- Use of existing data reporting structures such as reporting data on QI activities at staff meetings and medical rounds helps to engage staff [208, 209].
- Use of a report card with key QI measures helps inform program development in a structured way [44].
- Ensuring there is concise communications [56] about the QI work that incorporates the data assists with the continued participation in QI projects [47, 210, 211].
- Ongoing evaluation of implemented QI activities is essential to ensure that the new changes become embedded and continue to demonstrate the intended improvements [212-214]. A variety of methods can and should be used for evaluating quality improvement interventions [215-223]. This in turn aids in the sustainability of QI work [56]. This aligns to the idea that when evaluating whether QI is “working” in the organization this evaluation should be done at the individual, group and organizational level [224, 225].
- Context has an influence on data and therefore on quality improvement [226]. For example, if an organization is data driven in general this will impact QI projects that are reliant on data.

What are we still wondering about:

- What are the opportunities within existing public health data infrastructures that could be leveraged to enhance the output of real-time data?
- What are some best practices that have been used in public health settings to share data in an effort to implement QI work?

Domain 5: External Supports

QI collaboratives, accreditation and external funding and resources were identified in the literature as external supports for QI. Regional or national QI collaboratives bring individuals from different organizations together around a specific topic and allow for knowledge sharing and collective training to support QI work. Accreditation processes have mixed reviews in relation to whether the accreditation system simply works in parallel to support QI or if it is a driver of QI. Funding and resources outside the organization have also been stated to aid in the support for local QI work.

Enabler - Quality Improvement Collaboratives: A QI Collaborative is broadly defined as a group of clinicians, professionals or employees across multiple organizations “who have come together to achieve mutually agreed-upon

goals and address common organizational problems related to quality and safety in health care” [143]. QI collaboratives work together to a) identify interventions, b) share information on effectiveness of the interventions and c) discuss their implementation barriers and successes through the QI processes [143]. These collaboratives have been found to have several benefits in the implementation of QI work.

- Many individuals attribute QI success to being part of a collaborative as it provides structure, regular reporting and/or comparative reporting that supports sharing and learning [42, 54, 80, 137, 155] and reduced costs [227].
- Local teams supported by coaches and QI experts have positive impacts on achieving desired outcomes [137]. Engagement with QI experts in face-to-face video conferencing in a collaborative network helps to drive local QI initiatives [228].
- Collaboratives have been associated with an increase in local organizations’ ability to achieve the desired outcomes of their QI projects [42, 93, 229-234].
- An emerging area of focus is incorporating patients and families in to QI work that is done as part of QI collaboratives [70, 107].
- Being involved in a large collaborative project helps to build the organization infrastructure to engage in QI in other areas, contributing to a culture of improvement. [235-237].
- Ensuring that individual organizations voluntarily engage in the collaborative is essential to the success of the QI activities in the organization [28].
- Collaboratives help to form strategic partnerships with other health units which in turn help these collaboratives to access funding and resources while helping to reduce local organization costs [137].

Enabler - Accreditation: Findings related to accreditation and QI practice vary. Select reports indicate accreditation helps to push QI forward and motivates staff to engage in QI. Others report accreditation helps build a learning community and promotes information exchange and learning across settings.

- Annual reporting requirements reinforce QI activities and support their continuation [238].
- Accreditation builds a learning community with time for mutual exchange of information and learning in specific accreditation processes [239].
- More formal development and implementation of QI work is related to confidence in obtaining accreditation [24].

Enabler - Funding and Resources: Many organizations sought out external funding to support the implementation of their QI endeavours. These funding agencies were often linked with QI collaboratives or funding through local governments to support CQI training activities [35, 41, 62, 101, 138, 140, 143, 152, 235, 240, 241]. In the USA, it was outlined that greater regional and state-wide leadership together with community infrastructure is an important enabler of QI activities in local agencies [242].

What we are still wondering about:

- What might a QI collaborative look like for Ontario public health units?
- Are there any success stories of how some of these enablers have already applied a collaborative? What can we learn from them?
- Does peer review (accreditation/certification) influence the adoption and implementation of CQI in public health units? If so, how?

Discussion

Through our scoping review we identified several supporting enablers within five main domains for implementing CQI that could be considered in the public health setting. It must be noted that this literature was predominantly from the acute care sector and from the USA. Research reviewed from the public health sector demonstrated similarities in the domains and enablers when examined together with research from the other health sectors.

The major difference is the focus on QI practices framed within the preventive and health promotion nature of the majority of public health work. It is important to note that QI practices in the clinical care sector are often intended to improve clinical outcomes, and their improvement cycles are usually relatively short (i.e., measurement of impact occurs within a defined time frame). The nature of public health work, with its focus on population health outcomes, means reaching targets for improvement in health outcomes (as opposed to process improvements) may take longer. The impact of QI processes or initiatives intended to improve clinical or population health outcomes will not always be seen right away (i.e., measurement occurs over a longer period). As a result, commitment to QI practices as a public health leader requires vision and understanding of the long-term goals with an overarching CQI management approach. Leadership must be willing to make a long-term commitment to developing processes that demonstrate improved results and efficiencies within the public health system, which in turn enhance or improve population health outcomes [243, 244].

The literature was also mostly descriptive in nature and the review team examined the comments from the authors in relation to their findings, comments, views and conclusions. These comments reflect the domains of a CQI framework that would enable their QI practices to take place. These insights are valuable but also have inherent issues of hindsight bias that should be considered.

That said, the literature strongly pointed to key topics that were important to the implementation of a CQI framework.

- To implement CQI management practices the literature highlights the need for an organizational culture that is innovative and strategically aligned to principles of CQI. Supporting CQI principles is an essential part of organizational culture that allows for QI practices to be implemented with success.
- Training has been a topic of interest for many Ontario public health unit leaders. There was no single consensus on the best method for training but instead the literature points to various methods that have been used successfully.
- Hiring and performance reviews should support the values and behaviors that align to CQI. Having job descriptions and interview questions for new staff related to CQI would help to identify the right people to bring in to the organization and would align to the principles of CQI.
- Funding and resources for this work are essential to support experts or new hires. This is coupled with the need to ensure that multidisciplinary teams and approaches are supported within the organization to engage in QI practices.
- Differentiated roles and requirements were identified for leaders at the front-line, middle management and senior leadership levels. Integrating QI experts to facilitate QI practices and support current projects was important, especially in the early days of working through QI practices.
- The role of data was prominent in the literature with a clear focus on the importance of ensuring rigorous, real-time and reliable data which is leveraged through existing data structures when possible. The data will help to engage staff in the QI practices while informing and embedding QI in daily practice.
- External supports identified were linked to the idea of QI collaboratives that support the development, implementation and sharing of QI practices. Other external enablers that were outlined in the research were linked to accreditation and funding and resources from external agencies.

As noted earlier, it is important to think about these domains and associated enablers as individually important but also interrelated. It is difficult to highlight one as more important or necessary than another. That said, leadership is essential in setting the stage for individuals to feel supported to engage in QI practices and reinforcing a culture of CQI.

Limitations

A limitation of all scoping reviews is managing the process when a large dataset of articles is found. Given the number of reviewers we had as part of our team (N=12), it is possible that relevant information may have been excluded or missed from the project due to reviewer error. This has been addressed in the scoping review methodology through clearly articulated research questions and inclusion/exclusion criteria to guide study selection, a comprehensive search strategy supported by professional public health librarians, and documented sorting and abstraction processes with training for all scoping review participants. This was all done together with rigorous calibration processes during all levels of the article reviews.

There are inherent limitations with our search strategy due to the fact that the term 'public health' elicited research from other health sectors that would not traditionally be defined as public health in Ontario. That said, there was a great amount of literature that we felt would inform the project and therefore we decided to continue and include all of these papers in the review. One must be cognizant of the generalizability, or lack thereof, to public health in Ontario.

The countries that were included in the review were chosen due to the similarities in the demographics in the population and associated health-related concerns. However, there are different reasons for creating a CQI management approach to support QI projects and activities (i.e., private health care, government mandated) across these countries.

Conclusions

This study has identified enablers of the CQI management approach in five domains that together contribute to implementation of QI in health-related organizations and may be applicable in the public health setting in Ontario.

This scoping review has also identified several questions for future research. Exploring and reporting on how to operationalize the enablers into practice in Ontario public health units would contribute to the literature and practice environment of CQI in public health. The research team identified the following list of questions that may be the focus of future research:

- What have Ontario Public Health Units done to influence and change their cultural values and beliefs related to CQI?
- Are QI teams/workgroups of selected individuals who work on specific QI projects the most appropriate approach for QI practice, or should QI practice be inherently engrained in everyone's work?
- What are the core skills, education and certifications that would be important to integrate into job descriptions and job postings to ensure that staff are hired with appropriate QI skills? What would these look like for positions that are focused on QI (i.e., QI specialists) as compared to all other staff positions (i.e., public health nurses, health promoters, managers)?
- What do senior leaders need to know (i.e., level of training or understanding, specific content) about CQI to support a culture of CQI across the organization? What is the best mode of delivery of this information at a senior management level?
- What are the opportunities within existing public health data infrastructure that could be leveraged to enhance the output of real-time data?
- What are some best practices that have been used in public health settings to share data to implement QI work?
- What might a QI collaborative look like for Ontario public health units?

Next Steps

The findings from this project will inform future research to strengthen CQI in Ontario public health units.

Our goal is to advance CQI within and across Ontario's health units with evidence-based applied research grounded in the experience and perspectives of those working in the field of public health.

We will consult with health unit leaders and staff, system stakeholders, researchers and other decision makers in relation to the results of these research efforts to create an evidence-informed applied research project that will help to further propel CQI work in PHUs in Ontario.

Appendix A – Search Strategy

The full scoping review Search Strategy is available as a separate document at <https://www.publichealthontario.ca/en/ServicesAndTools/LDCP/Pages/CQI.aspx> or from the report authors.

Appendix B – Data Extraction Form

The data extraction form is available as a separate document at <https://www.publichealthontario.ca/en/ServicesAndTools/LDCP/Pages/CQI.aspx> or from the report authors.

Appendix C – Informative Articles for Public Health

Beitsch, L. M., Leep, C., Shah, G., Brooks, R. G., & Pestronk, R. M. (2010). Quality improvement in local health departments: results of the NACCHO 2008 survey. *Journal of Public Health Management & Practice*, 16(1), 49-54 46p.

Beitsch, L. M., Riley, W., & Bender, K. (2014). Embedding quality improvement into accreditation: evolving from theory to practice. *Journal of Public Health Management & Practice*, 20(1), 57-60.

Gillen, S. M., McKeever, J., Edwards, K. F., & Thielen, L. (2010). Promoting quality improvement and achieving measurable change: the Lead States Initiative. *Journal of Public Health Management & Practice*, 16(1), 55-60 56p.

Gorenflo, G. (2010). Achieving a culture of quality improvement. *Journal of Public Health Management & Practice*, 16(1), 83-84.

Price, A., Schwartz, R., Cohen, J., Manson, H., & Scott, F. (2017). Assessing Continuous Quality Improvement in Public Health: Adapting Lessons from Healthcare. *Healthcare Policy | Politiques de Santé*, 12(3), 34-49. doi:10.12927/hcpol.2017.25028

Price, A., Schwartz, R., Cohen, J., Scott, F., & Manson, H. (2016). Pursuing performance and maintaining compliance: Balancing performance improvement and accountability in Ontario's public health system. *Canadian Public Administration*, 59(2), 21.

Riley, W. J., Moran, J. W., Corso, L. C., Beitsch, L. M., Bialek, R., & Cofsky, A. (2010). Defining quality improvement in public health. *Journal of Public Health Management & Practice*, 16(1), 5-7.

Riley, W., Lownik, B., Halverson, P., Parrotta, C., Godsall, J. R., Gyllstrom, E., Mays, G. (2012). Developing a taxonomy for the science of improvement in public health. *Journal of Public Health Management & Practice*, 18(6), 506-514 509p.

Appendix D – Informative Websites for Public Health

Centers for Disease Control and Prevention (CDC) (2013). The Public Health System and the 10 Essential Public Health Services at <http://www.cdc.gov/nphpsp/essentialservices.html>

Centers for Disease Control and Prevention (CDC), (2013). State, Tribal, Local & Territorial Public Health Professionals Gateway at <https://www.cdc.gov/stltpublichealth/nphii/about.html>

Public Health Quality Improvement Exchange (PHQIX) at <https://www.phqix.org>

National Association of County & City Health Officials (NACCHO), (2013). Roadmap to a Culture of Quality Improvement at <http://qiroadmap.org>

Institute of Healthcare Improvement: Resources for Public Health Improvement at <http://www.ihl.org/resources/Pages/Tools/ResourcesforPublicHealth.aspx>

Appendix E – October 26, 2016 Face-to-Face Stakeholder Meeting Participants

- **Alex Berry**, Manager, Communications & Foundations Services, Northwestern Health Unit
- **Andy Bilodeau**, LDCP Project Coordinator, Northwestern Health Unit
- **Annette Sonneveld**, Supervisor, Performance Management, Toronto Public Health
- **Danielle Hunter**, Senior Research and Evaluation Analyst, North Bay Parry Sound District Health Unit
- **Dr Madelyn Law**, Professor, Brock University
- **Graham Hay**, Project Research Assistant, Brock University
- **Jane Beehler**, Librarian, Kingston, Frontenac, Lennox and Addington Public Health
- **Kara DeCorby**, Senior Product Development Advisor, Public Health Ontario
- **Katie Jackson**, Manager, Quality, Corporate, and Information Services, Leeds, Grenville and Lanark District Health Unit
- **Kristen Beaton**, Program Evaluator, Huron County Health Unit
- **Marc Frey**, Performance Improvement and Accountability Coordinator, Windsor-Essex County Health Unit
- **Meighan Finlay**, Standards and Accountability Officer, Wellington-Dufferin-Guelph Public Health
- **Nancy Wai**, Continuous Quality Improvement Supervisor, Lambton Public Health
- **Nicole Stefanovici**, CQI & Education Advisor, Niagara Region Public Health and Emergency Services
- **Paris Dickenson**, Brock University
- **Perri Champion**, Brock University
- **Samantha Jibb**, Planning & Evaluation Specialist, Northwestern Health Unit
- **Sarah Thompson**, CQI Specialist, York Region Public Health
- **Tanya Scarapicchia**, Program Facilitator, Knowledge Mobilization, Public Health Ontario

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Strengthening



IN ONTARIO'S
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2016-2017