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An evaluation of a frontline led quality improvement initiative

Barriers and facilitators to its success as part of a new quality management framework

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Abstract

Purpose – The Edmonton Zone, one of five Zones in Alberta Health Services (the health system in the province of Alberta, Canada), established a quality management framework (QMF) as a means to improve the delivery of high quality health care in the spring of 2014. The purpose of this research study was to understand the factors that facilitated or hindered the implementation of a quality improvement (QI) initiative for hand hygiene led by a newly formed frontline unit quality council (UQC), a part of the QMF, based out of the pediatric intensive care unit (PICU) at the Stollery Children's Hospital in the Edmonton Zone. This research will provide an understanding of the newly established QMF in the Edmonton Zone and the factors needed to foster the ongoing development of frontline UQC that do improvement work as part of their daily routine.

Design/methodology/approach – Using a qualitative case study research design data were collected using semi-structured open-ended interviews with six key stakeholders (one registered nurse, one physician, one patient case manager, medical director for QI, clinical QI consultant and director of clinical QI) involved in UQC at the PICU.

Findings – Individual, unit and organizational level factors were identified as influencing the function of the UQC. Leadership and work culture were the key facilitating factors to success and lack of QI training and personnel/dedicated time were perceived barriers to completing the QI initiative.

Originality/value – The findings from this research illustrate that frontline UQC are able to impact positive sustained change early in their establishment as part of a larger QMF. It is important, however, for the system to foster ongoing development of capacity and capability of these frontline UQC to ensure sustained success of the larger systems change.

Keywords Implementation, Quality improvement, Barriers, Quality management system, Facilitators

Paper type Research paper

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Introduction

The need to improve health-care quality has intensified within the past decade (Burhans and Alligood, 2010). In 2000, the Institute of Medicine (IOM) published their landmark report "*To Err Is Human: Building a Safer Healthcare System*" [Institute of Medicine (IOM), 2000], which signaled the urgent need for improvement in patient safety and quality of care. This report was followed by "*Crossing the Quality Chasm: A New Health System for the 21st Century*" (Institute of Medicine (IOM), 2001], which delineated the vision for safe, high-quality care that is evidence-based, patient-centered and systems-oriented. As a result of these seminal publications many health-care systems have focused on advancing quality improvement (QI) to ultimately improve patient care experiences, safety and health outcomes.

Health-care QI initiatives are incredibly complex. Such complex initiatives consist of several interacting components or "active ingredients" that target many levels of an organization or system; that require the behavioral changes of those delivering or receiving the QI initiative and that can result in a variable number of patient, process or system level outcomes (Craig *et al.*, 2013). The effect that complex health improvement initiatives may have in and between patients, providers, clinical units, organizations and systems may vary widely. From a review of the current literature, it is evident that there is no "magic bullet" to ensuring successful implementation and adoption of QI initiatives in the complex world of health care. However, it is clear that using appropriate efforts to understand the barriers and facilitators to improvement initiatives can lead to the implementation of more effective and efficient spread and scale up and sustainability of effective interventions across multiple health-care settings (Cochrane *et al.*, 2007).

Alberta Health Services (AHS) manages the health-care system in the province of Alberta, Canada. It comprises five zones, one of these being the Edmonton Zone. The need to develop a clear structure for QI became apparent to the senior leadership of the Edmonton Zone in 2013. Though a robust system was in place for quality assurance, this did not exist for QI. Upon the formation of AHS in 2008, QI was a provincial portfolio, with teams existing at the zone levels. Clinical quality consultants were assigned to individual projects across the organization, but there was not infrastructure developed for a QI system. As the organization matured, it became apparent that QI efforts were siloed and fragmented across the system resulting in inefficiency and perceived lost opportunities for sharing ideas and achieving large scale improvement. As a result, the Edmonton Zone leadership struck a working group and established the conceptual model of the quality management framework (QMF) based on literature review, consultation with internal stakeholders and an environment scan of other similar organizations. The purpose of the QMF is *to provide vision, leadership and direction for quality planning, quality monitoring and QI within the Edmonton Zone*. The main objectives of the QMF are *to enhance an integrated approach to quality within the zone and develop a structure that links frontline health-care providers to senior administration*. The key concepts underlying the vision for the QMF are interdisciplinary engagement that incorporates both a top-down and bottom-up approach. It is critical for the organization to provide a clear vision and mission to ensure a clear sense of shared purpose for its employees (Hacker, 2010; George *et al.*, 2007). At the same time, organizations must balance this top-down direction with empowering leaders at every level of the organization to engage frontline teams who are able to work

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collaboratively with a clear sense of purpose. This can result in resilient, high functioning teams throughout the organization who complete that is personally meaningful and beneficial to organizations.

The QMF structure includes three layers – unit quality councils (UQC), site/program quality councils and the zone quality council (Figure 1).

The terms of reference that guide all councils are based on Juran's QI philosophy of Quality Planning, Control and Improvement (Juran, 1986). The term Monitoring was utilized rather than Control because it was felt that the term "control" had negative connotation for health-care providers and monitoring adequately described the intent. Therefore, the purpose of a UQC is to provide a venue for front line teams to participate in QI work, including quality planning (coordinate QI activities on the unit and engage staff and families in these QI activities), quality monitoring (utilize data, set performance targets) and QI (conduct QI activities using standard QI methods). The overall goal of these quality councils are to deliver better quality, better outcomes and better value to patients. The QMF structure is underpinned by these UQCs with a distributive leadership model that empowers frontline health-care providers to make decisions and to solve their problems at a local level. The UQCs are mentored by a clinical quality consultant assigned to their program/site from the Zone, if the Site or Program does not have their own embedded experts. The role of the clinical quality consultants is not to project manage but to develop skills in the frontline staff and coach them through their projects, thus building capability and capacity within the system.

Figure 1.
Quality management framework structure provided by the quality management framework team, Alberta health services

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The QMF was first implemented at the Stollery Children's Hospital, Edmonton, Alberta, Canada, in May of 2014. This research study was conducted with the pediatric intensive care unit (PICU) UQC, which was formed a few months prior to the Stollery unit implementation (February 2014) because of restructuring of the PICU work environment. The PICU UQC consists of three team leaders (two pediatric physicians and the unit patient care manager) and its multi-disciplinary health-care professional membership from medicine, nursing, pharmacy, physiotherapy, occupational therapy and dietetics. The UQC identified four key priority areas for improvement. Hand hygiene compliance was one of the four priority areas identified for improvement and was the most advanced QI initiative by the PICU UQC. This research paper evaluates the facilitators and barriers to the implementation of a hand hygiene QI initiative by the PICU UQC as part of a large scale systems change – the QMF in the Edmonton Zone.

Research aims and objectives

The aim of this research study is to understand the facilitators and barriers to the implementation of a QI initiative for hand hygiene driven by front-line health-care providers. This QI initiative was implemented by a part of a system level QI structure – the QMF. Understanding the factors that hinder or facilitate the success of frontline QI councils that are part of this structure are critical to ensuring success of the QMF as a whole systems change.

Research methods

Using a case study qualitative research design, we conducted face-to-face, semi-structured, in-depth interviews with a convenience sample of six key informants for the initiative (nurse, physician, case manager, medical director and two QI consultants) to generate in-depth descriptions of their perspectives. We used the Ottawa Model of Research Use (OMRU) (Logan and Graham, 1998) to develop our interview guide (Appendix). The OMRU is a comprehensive, interdisciplinary framework on the elements (the innovation, potential adopters, practice environment, transfer strategies) that affect the process of health-care knowledge translation (adoption and outcomes). The Alberta School of Business Research Ethics where this research was formed granted ethical approval for this study. A clinical quality consultant at the Edmonton zone facilitated recruitment of participants by an invitation email that explained the rationale for the study and included the informed consent form.

Interviews were audio recorded with the permission of the participant. To assure anonymity and confidentiality, each of the six participants was assigned an identification number (P1-P6). Using thematic analysis, each interview was transcribed verbatim, with key statements that represented participant experiences extracted from each transcript. From these key statements, formulated meanings were extracted and grouped into themes that had emerged from the data (Patton, 2001). It is from these clusters of themes that the descriptive results were formed and are presented narratively.

Research findings

From thematic content analysis of the six qualitative interviews, themes were identified and grouped according to barriers vs facilitators to the implementation and adoption of the hand hygiene QI initiative by the PICU UQC. The most prominent barriers and facilitators are outlined in Table I.

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From the six interviews conducted with participants across multiple levels of the QMF, it was evident that the facilitators to this initiative outweighed the barriers. Participants more frequently discussed positive elements and facilitators to the implementation of this QI initiative. For the purpose of this paper, we focus on the most prominent themes of facilitators that emerged from qualitative analysis of the data (leadership and work culture) and the most prominent themes of barriers that emerged (lack of resources and personnel support and lack of QI training).

Leadership

All of the participants identified supportive leadership as a critical component to the success of the QMF at the zone level, the UQC level and at individual level. Supportive leadership was described in multiple ways and included supportive leadership by senior administration, operational managers, PICU physician and by the frontline health-care providers. The participants stated that without supportive leadership at each of these levels the QMF and UQC would not have worked and the hand hygiene improvement initiative would not have been such a success:

> P1: Staff feel empowered and supported that it is increasing their desire to become involved in quality work.

> P2: Management have been very supportive, we have great communication, they give the resources to buy any equipment and to move forward with the improvements, the improvements from hand hygiene effect other aspects of care, so it has a trickle-down effect.

> P3: What works is that it is the front line staff leading the work, leading the improvements and change and it's not the managers doing the work they support the front line staff.

It appears from the interviews that the success of the hand hygiene initiative was not solely because there was leadership but specifically because of the approach taken towards leadership. The approach to leadership was not a top-down, directive approach but a bottom up approach with a distribution of leadership model across all levels of the system. Two key concepts that emerged from analysis of the interviews were building capability and capacity, some participants discussed that the application of these two principles empowered the front-line health-care providers to be individual leaders in improving their hand hygiene practice and increased their confidence to tell and show other staff and health disciplines what is best practice:

> P1: Staff feel empowered and supported that it is increasing their desire to become involved in quality work.

Table I.
Key barriers and facilitators to implementation of the QI initiative

Barriers	Facilitators
Lack of resources and personnel support	Leadership support
Lack of QI training	Work culture
Resistance to change	Frontline driven
Lack of time	Desire to improve patient care
	Recognized problem area

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Another key theme that was discussed simultaneously with leadership was the concept that the initiative was driven by the frontline health-care providers. This was seen as a key facilitating factor to the success of the hand hygiene initiative:

> P2: Hand hygiene has done well, driven by the front line staff, changes have been the suggestion of front line staff with management support.

The UQC also has a dedicated champion leader for the hand hygiene initiative, a registered nurse whose role is to lead, monitor and communicate with staff about the hand hygiene initiative. One participant stated that this role was crucial to the success of the hand hygiene initiative and a key factor for any quality initiative:

> P4: You have to have a dedicated champion, when people see her they go to the sink, because they know she is the person driving hand hygiene.

A QI consultant is affiliated with the PICU UQC. The participants recognized this QI consultant as key facilitator to the success of UQC hand hygiene initiative and appreciated that the QI consultant took on a guiding role rather than a directive managerial role:

> P4: The success of this initiative is a combination of the supervision from the QI consultant and volunteer champion who is driving this project, you need a combination the two because the champion had no prior knowledge or training in QI and they needed a lot of coaching in QI tools which has been given by the QI consultant, without the guidance of this QI consultants we probably would have gone round circles and maybe started but not maintaining or tracking properly.

From the perspectives of the QI consultants they lead in a coaching capacity rather than a directing "top-down" capacity:

> P6: QI is a team sport, we lead from behind in a coaching role.

Organizational culture

A second major facilitator to the success of the UQC was the work culture of the PICU. The PICU had previously participated in QI efforts at their unit and the leading physicians at the PICU are highly interested in QI work and are also trained in QI methodology. The participants spoke about the PICU as a work environment that is supportive of QI with strong working relationships between the physician and nursing staff:

> P2: Everyone wants to do better and they want to be the best, there is a very casual relationship between the physicians and nurses, we have a fun positive attitude. The PICU environment can hinder QI because we are too busy, but it's a tight group, a competitive group, that wants to do better.

It was also mentioned that participation in the UQC is voluntary therefore those who partake want to be involved in a work culture that supports quality and patient safety:

> P4: Everyone that takes part in these committees are people that are seeing two things, first seeing the need to do something, they know the importance by reading the literature, attending conferences and secondly those are people that are motivated to make a difference, these people are thinking the same way.

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One participant discussed that the PICU creates a positive motivational and empowering work environment for its frontline health-care providers:

> P6: Also we create opportunity for them to do something beyond the everyday routine, being a part of something that innovates, new fresh ideas to the unit, people feel empowered and motivated.

The principles of QMF also strengthened the work culture of the PICU through QI coaching, capacity and capability building and providing the tools necessary to take part in these QI initiatives. The QI consultants also discussed the importance of the culture when approaching teams about QI work. Culture was mentioned at two levels, at the individual unit level and also at the organizational level. One participant discussed this concept in detail:

> P5: There is a culture with active and visible leadership at the organizational level and at the unit level there is the awareness, knowledge, desire and understanding to do better.

> P6: People are happy and excited about it. See something that will improve patient care and that they can be involved in.

Despite the apparent successes of the PICU UQC and hand hygiene initiative under the QMF participants also discussed some perceived barriers to completion of QI work. Two prominent barriers identified from the data analysis were lack of resources, including personnel support and lack of QI training.

Lack of resources and personnel support

The frontline health-care providers believed that lack of resources, including personnel was a key barrier to successful completion of QI work by their UQC. In particular, lack of financial support by the Edmonton Zone to provide additional personnel to support the UQC was identified as being problematic. Participants mentioned that they had thought that the Edmonton Zone would provide financial and extra personnel support to form the UQC and support the QI initiatives:

> P4: Disappointed that we got the structure going and it is a valid structure and it is starting to show its results but the element of personnel and cash inflow into this initiative is still missing we are relying on people to do this from a voluntary purpose.

> P4: Relying on volunteers is the biggest pitfall to this project, industry have dedicated offices in quality and we are very bad at doing that.

> P6: Front line staff think it's (Quality Management Framework) something being imposed on them, think its new work, resources comes up as a major barrier.

The QMF does not provide these elements but instead helps to form the appropriate structures and give the capability and capacity to the frontline health-care providers to lead their own local changes. For the hand hygiene initiative, a nurse was provided with dedicated time to champion the project. However, from the QI leadership perspective, this barrier will not change because there is no additional funding to support extra personnel.

Lack of QI training

Lack of training in QI was discussed simultaneously with the lack of resources and personnel support. The participants appreciated that the initiative was front-line driven,

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but they also expressed concerns that front line staff did not have sufficient knowledge about how to do QI work and had not received the appropriate training because QI methodology training is not a standard requirement across the organization. It is available to those who are interested in the form of online modules or in-class sessions through AHS Quality and Patient Safety Skills Development:

> P1: We have some training at the quality council meetings but there has not been a lot of training so far. Staff are encouraged to take the QI courses but there is no QI department at the children's hospital.

Another frontline health-care provider stated:

> P4: I have had training in QI but few people in these groups have that training and have no clue, now we have a consultant working with us bringing up these tools, it is good to have this resource, you need a coach to teach you, this is fundamental.

This challenge was also made from the perspective of a QI expert:

> P3: One challenge is slowing them down. They want to change a thousand things, and understanding measurement, messaging the QI language to front line health-care providers can be challenging. There needs to be a lot of front work in QI to make sustainability easier.

All participants recognized this as a challenge, a system-wide financial challenge that is not easily modified. Each of the participants expressed the desire to have personnel dedicated to QI work at unit levels and for all frontline health-care providers to be expected to train in QI; however, it was acknowledged by the participants that this would not be a simple task. One participant stated that to overcome this barrier individual units can learn from other areas in the organization which have been creative with their budgeting and scheduling and set QI engagement as continuing professional development expectation:

> P6: There are pockets of places that are investing personnel in QI and state that it is worth the investment.

In addition to the thematic findings of this study, it is also important to note that from local data rates, the PICU hand hygiene rates have improved from 50 to 94 per cent with the combined efforts of the UQC and the PICU staff (Figure 2) (Alberta Health Services, 2014). These findings demonstrate the success of this frontline lead QI initiative to date.

Discussion

Health-care QI initiatives are complex social interventions that occur across a variety of contexts at multiple levels of a health-care system (e.g. patient, health-care provider, multidisciplinary team, health-care institution, and local and national health-care system levels) and require the adoption of multiple key players in health care (e.g. patients, frontline health-care providers, managers, administrators, policy-makers) (Bhattacharyya *et al.*, 2011). Health-care QI initiatives cannot be evaluated without consideration of the complexity of the environments in which they occur such as the context, the people involved and the content of the initiative (Walshe, 2007). There is an extensive research evidence that demonstrates the importance of understanding the barriers and facilitators to implementing health-care QI initiatives to improve the translation of these initiatives to front-line clinical practice (Bloom, 2005) (Shaw *et al.*, 2005). There is also a large body of literature that supports the argument that initiatives

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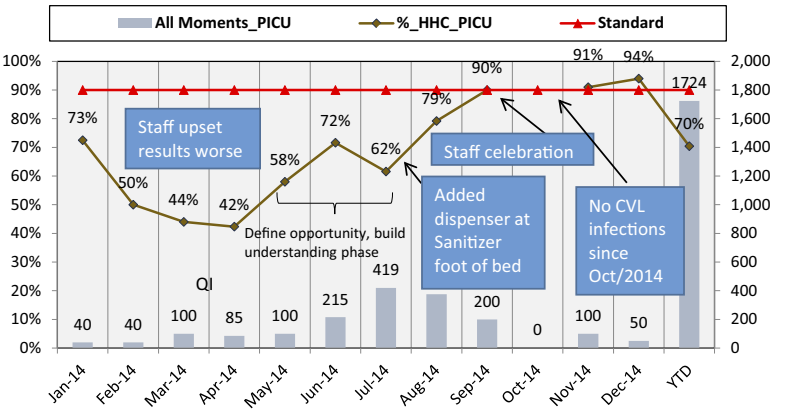

Figure 2.
PICU hand rates from January 2014-December 2014

designed to improve health-care practice should be based on the needs of the key players involved and on a prior assessment that identifies facilitating factors for successful implementation (Greenhalgh *et al.*, 2004) (Oxman *et al.*, 1995). Qualitative analysis of our data highlighted important barriers and facilitators to the implementation of a QI initiative by the newly formed PICU UQC. Understanding these barriers and facilitators to implementation are critical for the future work of the UQCs under the larger system QMF structure. The QI macro-system structure (QMF) for QI at AHS can only be as effective and efficient as the micro-level structures (e.g. PICU UCQ) that make up the QMF.

Leadership, organizational culture and training are consistently mentioned in the literature as key factors to QI and change implementation (Gifford *et al.*, 2006) (Doumit *et al.*, 2007). First, these findings demonstrate that it is the approach to leadership which is critical to the success of the QI initiative rather than the presence of leadership. The distributive model of leadership incorporated into the QMF has been highly successful in this study context. A blended approach of top-down and bottom-up collaborative leadership is new to health care and perhaps the future direction for successful QI and change implementation. Future research is needed on the evaluation of a distributed model to leadership in health care and its impact on QI, staff empowerment, engagement and patient care. Second, these findings demonstrate that a positive organizational and unit culture can be created and improved on. In addition, part of the culture change across the organization includes the philosophy that QI is part of everyday work not something additional that we do. This concept is being supported by senior leadership and is reflected by participation in QI being adopted as part of performance appraisal. At first, staff were resistant to the QMF and the concept of a UQC. Yet, once staff were included in the decisions and learned that they would lead the work and would be provided with the capability and capacity to do so, they became engaged and empowered. Allowing the staff to identify the areas in need of improvement contributed to staff engagement and empowerment and developed a culture, where all of the staff felt that hand hygiene was an important area for improvement and they individually and collectively wanted to do better. Research evidence suggests that empowerment of staff leads to organizational effectiveness (Laschinger *et al.*, 2001) and better patient care outcomes (Laschinger *et al.*, 2006).

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Many quality issues and adverse events in health care are preventable. Poor quality and adverse events are costly to our health-care systems. The cost of adverse events in Canada is $1.1bn, including $397m/year for preventable adverse events (Etchells *et al.*, 2012). This study is one example that shows that addressing preventable harm (e.g. infections) through investing in QI methodology training of front-line providers' teams supported by embedded QI experts can ultimately reduce costs for the health-care system. We propose that one approach to long-term health-care system cost savings would be to have greater investments in QI development that is focused on training and providing front-line health-care providers with the capacity and capability to lead QI work.

The findings also emphasize that despite the success of the initiative, relationship building, leadership distribution, capacity and capability building and staff empowerment developed from the QMF, staff are still unsatisfied by the lack of financial and personnel support. Participants believed that the QMF would come with additional financial and personnel support for the UQC. Following some exploration, it seems this is an assumption likely based on the organization's historical approach to QI work using a project management approach, where a trained consultant would complete a project in an area with limited involvement and accountability of local staff. Thus, QI projects came with a resource that was very visible to the frontline staff. Historically, the quality leadership found that this approach did not achieve desired outcomes but resulted in limited uptake of the recommended intervention, incomplete projects and lack any improvement and/or sustained positive results, which in part also prompted the systems change.

The QMF approach is very different because it provides structure and some limited quality consultant time to mentor the front-line teams. Ultimately, the structure is intended to develop the capability and capacity of frontline health-care providers to lead and be responsible for their own local changes. Providing clear direction from the senior team, balanced with encouraging leadership at the local level coupled with innovative problem solving can result in engaged high-functioning teams (Hacker, 2010; George *et al.*, 2007). The goal is that with ongoing project work, professional development and coaching by the embedded clinical quality consultant, front-line councils will develop members with a rounded QI skill set, and the work will be sustainable in all areas across the organization. The new understanding of the perception of staff from previous experience of how QI was managed using a project approach is an important finding as can be highlighted and discussed openly with teams because the framework continues to evolve as part of the change management strategy. The success of the PICU UQC in their ability to implement and be successful in their systems improvements by achieving and sustaining their 90 per cent hand hygiene compliance (from their baseline of 50 per cent) has demonstrated that it is possible for frontline providers to complete QI work with limited support by an expert. Stories with data such because this can be shared as positive examples throughout the organization to facilitate the culture change of how QI is approached in the organization. This research is important for other health-care systems that want to develop and implement a formal QI system or structure that is driven by front-line health-care providers and targets multiple-levels of a system. Our teams experience in developing, implementing and evaluating the QMF structure and implementation

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is important to share within the context of AHS and also to other health-care systems that are developing formal QI structures to improve health-care delivery and patient care.

Limitations

Some limitations to this study are the small sample size of six participants and the limited generalizability of these findings to other contexts. However, the purpose of this research was to evaluate factors that impacted the ability of our local UQC to complete a QI project as a frontline team in the Edmonton Zone QMF.

Conclusion

These findings provide an important understanding about the perceived barriers and facilitators in frontline health-care providers undertaking QI work in health care. These findings also illustrate how a system wide QMF can successfully function at the unit level and what factors are critical to that success. These elements should be considered at the planning and development stages of any complex systems change. There is no magic bullet to systems transformation because every individual, team and context to which the change applies are unique and despite key efforts in the planning stage there will always be hurdles to overcome as the system evolves and matures. Health-care providers are very interested in participating in frontline QI initiatives, and most certainly visible leadership, a distributive leadership model and autonomy are all facilitators of success of this new framework. However, there is an increasing expectation on health-care providers to participate in system wide initiatives that continuously improve patient outcomes, without adequate training and dedicated personnel and financial support to do so. The findings from this study stress the importance of investing in QI personnel and training of health-care providers in QI methodology. This UQC demonstrated the ability to successfully sustain improvement in hand hygiene rates with limited resources provided to do so. This research study occurred during the early phases of QMF development, and continuous assessment and cycles of evaluation can ensure that barriers to improvement are addressed early on and that this new structure can continue to grow and flourish. This study will provide those leading the system wide transformation with knowledge to inform the spread and scale up of the QMF and enhance development and sustainability in the Edmonton Zone of AHS.

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Appendix

Semi-structured interview guide

- Can you tell me about the development of the Quality Management Framework (QI initiate)?
- Can you describe the QI principles and evidence guiding this QI initiative?
- Can you tell me how priority clinical areas were identified for this QI initiative? Why hand hygiene at the PICU?
- Can you describe the implementation of the Quality Management Framework for hand hygiene in the PICU?
- Can you describe any facilitators you have experienced in the implementation of this QI initiative?
- Can you describe any barriers you have experienced in the implementation of this QI initiative?
- Who are the people driving/championing the Quality Management Framework for hand hygiene in PICU?
- Can you describe your work environment?
- Are there any indicators that any outcomes have improved?
- Can you describe the future goals/next steps of this initiative?

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