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Decision-maker roles in healthcare quality improvement projects: a scoping review

Justin Gagnon ,[1] Mylaine Breton,[2] Isabelle Gaboury[1]

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[1]Department of Community Health Sciences, Université de Sherbrooke, Sherbrooke, Quebec, Canada
[2]Department of Family Medicine and Emergency Medicine, Université de Sherbrooke, Sherbrooke, Quebec, Canada

Correspondence to
Dr Justin Gagnon;
justin.gagnon@mail.mcgill.ca

ABSTRACT

Objectives Evidence suggests that healthcare quality improvement (QI) projects are more successful when decision-makers are involved in the process. However, guidance regarding the engagement of decision-makers in QI projects is lacking. We conducted a scoping review to identify QI projects involving decision-makers published in the literature and to describe the roles decision-makers played.

Methods Following the Joanna Briggs Institute framework for scoping reviews, we systematically searched for all types of studies in English or French between 2002 and 2023 in: EMBASE, MEDLINE via PubMed, PsycINFO, and the Cumulative Index to Nursing and Allied Health Literature. Criteria for inclusion consisted of literature describing health sector QI projects that involved local, regional or system-level decision-makers. Descriptive analysis was performed. Drawing on QI and participatory research literature, the research team developed an inductive data extraction grid to provide a portrait of QI project characteristics, decision-makers' contributions, and advantages and challenges associated with their involvement.

Results After screening and review, we retained 29 references. 18 references described multi-site projects and 11 were conducted in single sites. Local decision-makers' contributions were documented in 27 of the 29 references and regional decision-makers' contributions were documented in 12. Local decision-makers were more often active participants in QI processes, contributing toward planning, implementation, change management and capacity building. Regional decision-makers more often served as initiators and supporters of QI projects, contributing toward strategic planning, recruitment, delegation, coordination of local teams, as well as assessment and capacity building. Advantages of decision-maker involvement described in the retained references include mutual learning, frontline staff buy-in, accountability, resource allocation, effective leadership and improved implementation feasibility. Considerations regarding their involvement included time constraints, variable supervisory expertise, issues concerning centralised leadership, relationship strengthening among stakeholders, and strategic alignment of frontline staff and managerial priorities

Conclusions This scoping review provides important insights into the various roles played by decision-makers, the benefits and challenges associated with their involvement, and identifies opportunities for strengthening their engagement. The results of this review highlight the need for practical collaboration and communication strategies that foster partnership between frontline staff and decision-makers at all levels.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Existing literature underscores the crucial role of decision-makers in the success of healthcare quality improvement (QI) projects; however, literature detailing their engagement and contributions is scant.

WHAT THIS STUDY ADDS

⇒ This scoping review provides a comprehensive examination of QI projects involving decision-makers, highlighting their diverse roles and the specific advantages and challenges associated with their involvement.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Insights from this review can guide the development of strategies for optimising decision-maker engagement in QI projects, potentially enhancing the success and sustainability of such initiatives.

INTRODUCTION

Over the last decade, the use of quality improvement (QI) models in healthcare has become increasingly widespread. Health system decision-makers and frontline staff have embraced QI as a way of meeting the demand for increasing the quality, efficiency and cost-effectiveness of health service delivery.[1 2] QI involves the systematic examination of processes and the development, implementation and evaluation of small-scale interventions, using rapid-cycle testing.[3] It is, therefore, well-suited for rapidly adapting to changes in systemic and organisational conditions, and better aligning services to meet population needs.

Despite the potential for QI to enhance health service delivery, its impact appears to be mixed.[2] While some evaluations have reported substantial improvement through the conduct of QI projects, in many cases the anticipated change is seldom achieved or

sustained.[4–8] A systems approach, taking into account the complexity and adaptability of healthcare systems,[9] and involving frontline staff and decision-makers, is considered critical to successfully achieving and sustaining organisational transformation.[10–12] Indeed, evaluations of QI projects have consistently highlighted the vital role of decision-makers in ensuring their success.[1 10 13–15]

Support and engagement from decision-makers at all levels are essential for staff buy-in and commitment to QI projects and promoting a culture of continuous improvement.[1 14 16 17] In this paper, 'decision-makers' is used to signify actors who formally possess decisional[18] (strategic, tactical or operational) authority and contribute to resource allocation within the organisational hierarchy. We distinguish between local decision-makers and regional decision-makers, whereby the former refers to organisational managers and administrators (eg, unit managers, frontline managers, hospital administrators, clinic directors), and the latter refers to regional administrators and policy-makers.[19] At the organisational level, local decision-makers play a pivotal role in ensuring the delivery of high-quality care and patient safety. Their mandates include overseeing the implementation of effective strategies and practices that contribute to positive health outcomes.[15] They possess the authority to expedite or impede the implementation of innovations within their organisation.[12 17]

In the context of QI projects, the support of decision-makers becomes particularly vital, especially when staff encounter time constraints and limited scheduling flexibility.[20] Local decision-makers can address these challenges by actively championing the allocation of necessary resources and protected time for education and implementation activities.[21] Furthermore, they can act as information brokers, facilitating communication and collaboration between different levels of management, and they can help bridge the gap between frontline staff and senior management, advocating for frontline staff's needs and concerns.[12] Moreover, local decision-makers can ensure the alignment of QI projects with organisational strategy, translate strategic priorities into actionable tasks, and delegate responsibilities.[12 20 22] This strategic alignment, as well as their greater accountability to ensure the project is well-resourced and supported, can enhance the effectiveness and sustainability of QI projects.[12 17] In addition to local decision-makers, regional and policy decision-makers also play a crucial role in supporting frontline staff's participation in QI activities by establishing guidelines, providing funding opportunities and creating incentives that encourage frontline staff's engagement in improvement efforts.[23 24]

Inclusion of decision-makers is not only considered critical to the success of QI projects, but evidence suggests that their continuous involvement throughout the QI project, beyond the initial stages, is associated with a higher probability of sustaining improvements.[22] However, several authors have observed that decision-makers' involvement seldom extends beyond an expression of support.[17 20] By being actively engaged, decision-makers are better able to address challenges and make timely decisions throughout the process, provide ongoing guidance and support when issues arise, and ensure alignment of the project with organisational priorities.[6] Securing their successful engagement requires a systematic strategy for communication and collaboration between decision-makers, frontline staff and other stakeholders involved in the QI project.[25]

Despite widespread recognition of the significance of decision-makers' input and support and the need for their sustained engagement, there appears to be a dearth of literature focusing on their engagement and collaboration in QI projects.[16 26] While QI teams would benefit from guidance on effectively involving decision-makers in these endeavours, authors report that QI reports tend to lack sufficient detail on how QI teams engaged with decision-makers[15 17] and empirical research exploring the roles of decision-makers in QI implementation remains scant.[15 17 26] To optimise decision-makers' collaborative contributions and ensure the success and sustainability of QI projects, a deeper understanding of their engagement in QI activities is needed.

Objectives

The objectives of this scoping review were to identify, within published literature, QI projects that involved decision-makers and describe the roles decision-makers played throughout. The review question was the following: what is the state of the literature regarding decision-makers' involvement in healthcare QI projects?

METHODS

We conducted a scoping review following the Joanna Briggs Institute methodological framework[27] and adhered to the Extension for Scoping Reviews of Preferred Reporting Items for Systematic Reviews and Meta-Analyses: Checklist and Explanation.[28]

Search strategy

The search strategy (online supplemental appendix I) was collaboratively developed by the research team, with the assistance of a medical librarian. Literature search strategies were developed using medical subject headings and text words related to *quality improvement*[29] and *decision-makers*. We searched Medline via Ovid, Embase via Ovid, PsycInfo via Ovid, and the Cumulative Index to Nursing and Allied Health Literature via EBSCO. We also searched ProQuest for relevant theses and dissertations, and the Institute for Healthcare Improvement for QI reports. However, an initial scan of these sources did not detect any eligible references, as decision-makers' involvement was not sufficiently documented. Therefore, these sources were excluded from the search. Searches were restricted to English or French language texts published between 2002 and 2022, to focus on more recent literature. The search was conducted in April 2022 and updated in June 2023.

Our inclusion criteria specified that the literature should describe healthcare QI projects involving local, regional or system-level decision-makers. To be considered a QI project, the criteria for 'continuous quality improvement' (CQI) established by Rubenstein *et al*[30] were used, which included: systematic data-driven activity, iterative development and testing, and adaptation to local conditions.[30] We restricted the review to CQI as our study aim involved understanding decision-makers' sustained engagement in improvement activities. There were no restrictions concerning the type of healthcare setting or the geographical location. References that did not describe, in detail, the processes or outcomes surrounding the conduct of a single QI project were excluded. References that did not mention decision-maker involvement during the abstract review stage were also excluded, unless projects were conducted in multiple sites, as we considered these to have a high probability of involving regional decision-makers.

Study selection and data abstraction

Bibliographic data were imported into DistillerSR,[31] whereupon duplicate entries were detected and removed. The titles and abstracts were then screened by two independent reviewers for eligibility. After samples of abstracts were reviewed, inclusion criteria were discussed and iteratively refined by the reviewers and research team. References about which reviewers disagreed were included for full-text screening. A complete dual review screening process was used at the title and abstract stage to minimise the risk of excluding an eligible reference.[32]

Following the abstract screening, the research team reviewed a sample of texts to identify references that met the established criteria for retention, thereby cultivating a common understanding and facilitating the identification of pertinent projects during the full-text review. The first author then screened the retained full texts. In cases where there was ambiguity regarding the exclusion of a reference, the senior author screened the reference and its inclusion was discussed.

Descriptive analysis[33] of the data extracted from the retained full texts was performed. In the context of scoping reviews, descriptive analysis involves a comprehensive review and categorisation of collected literature. Given the exploratory nature of this study, descriptive analysis was an ideal analytic approach as it enabled us to map the landscape of existing literature, understand the range and depth of the topic and identify knowledge gaps that warrant future investigations.

The research team collaboratively developed an inductive data extraction grid, following an iterative process. This grid aimed to capture relevant QI project characteristics and the different roles decision-makers played. We examined published systematic reviews involving QI,[34–36] and included fields that describe the QI projects (eg, objectives, intervention, QI framework, improvement outcome). To generate fields that met our objective and adequately reflected decision-makers' roles and engagement (eg, roles, contributions, engagement strategies, benefits of collaboration and collaboration challenges), we drew on our experience with participatory research and QI. We categorised decision-makers' contributions based on the extent of their involvement and the flow of information using a conceptual framework we developed following a deductive-inductive approach. Deductively, our framework combined elements adapted from participatory frameworks,[37 38] including the IAP2's Spectrum of Public Participation and the Steering Committee for Humanitarian Response's Peer Review on Participation, which delineate varying degrees of involvement from information sharing to collaboration. We also drew on leadership and decision-making models,[39 40] which describe the direction and support that leaders offer to their team members, from telling (authoritative) to delegating (collaborative). Inductively, our categorisation was influenced by our interpretation of the extracted data on decision-makers' contributions to each of the projects (see online supplemental appendix III for examples) and enriched by QI literature detailing leadership roles in QI projects.[41]

Our conceptual framework describing decision-makers' roles comprised four categories: initiator, supporter, consultant and collaborator. Initiators are decision-makers who spearhead QI projects, playing a role in strategic planning, preparation for implementation, identification of project champions, recruitment, delegation and the development of key project indicators. Supporters offer essential backing to QI projects, serving as advocates and sponsors, and providing implementation support. Consultants lend expertise to QI projects, assisting in the delineation of strategies, interventions and outcomes, to ensure alignment with organisational objectives. Collaborators, typically members of QI teams, actively engage in various project aspects including planning, implementation, team leadership, capacity building and the facilitation of change management.

Retained full texts were imported into NVivo (V.1.7)[42] for coding and data extraction. Using NVivo, the first author tagged specific text selections from the retained references according to the initial coding grid. The research team then reviewed the outputs from the initial grid and generated a revised version that was used to complete the data extraction and analysis. Descriptive data were then inserted into tables to facilitate description and enable visual comparison and interpretation.

RESULTS

As displayed by the study flow diagram (figure 1), our initial search (performed in April 2022) identified 14 675 references with duplicates removed using DistillerSR. After screening the titles and abstracts, 188 references remained. At this stage, we excluded 14 487 references that did not pertain to healthcare, did not involve QI projects, or did not mention the involvement of decision-makers in any capacity. We then proceeded to review the

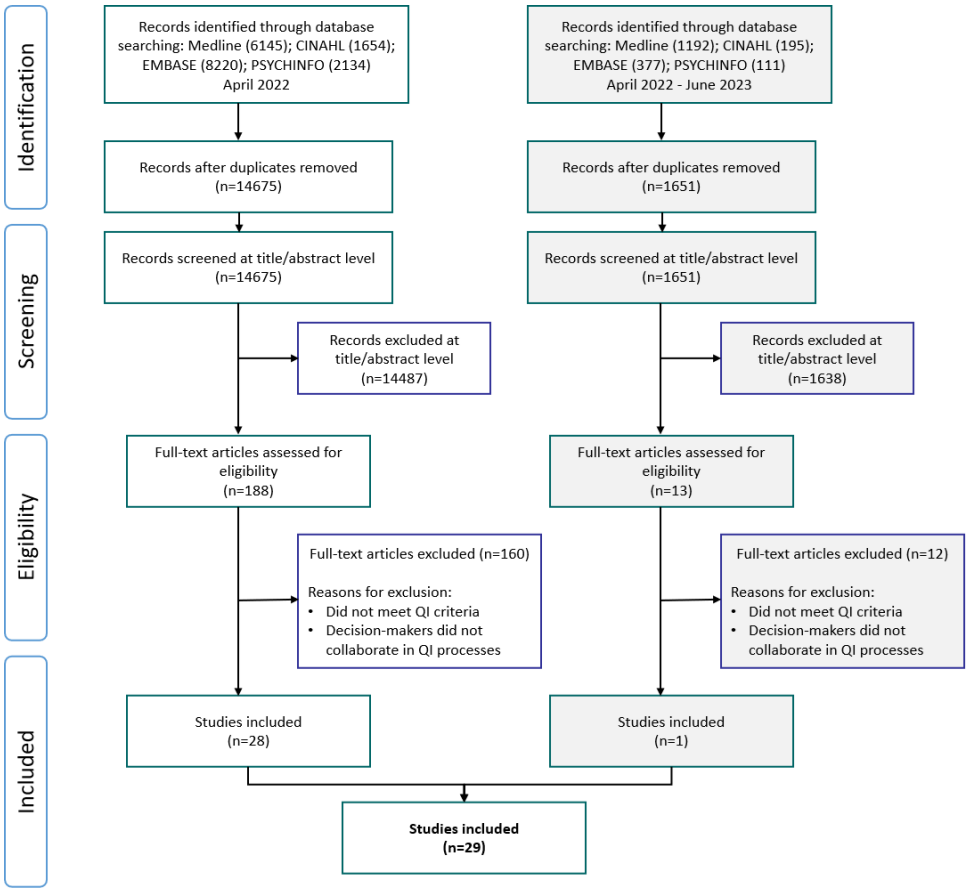

Figure 1 Extension for Scoping Reviews of Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram. QI, quality improvement.

full texts of the remaining 188 references for inclusion. Of these, 28 met our criteria and were retained for data extraction. The 160 references were not retained due to either the criteria for CQI not being met or the lack of involvement of decision-makers. On re-running the search in June 2023, one additional reference was retained after the results were reviewed. Below, the data from these texts are presented according to QI context and processes, and engagement of decision-makers. The descriptive data are presented in full in tables 1 and 2 (expanded versions are provided in online supplemental file 2).

QI context and processes

Table 1 displays the characteristics of the QI projects as described in the 29 references. 26 references[43–68] provided a retrospective description of QI processes and a longitudinal evaluation of their impact on selected outcomes, and three[69–71] reported findings at an intermediary stage. Among the selected references, four[47 48 52 54] also reported on factors that either facilitated or hindered the implementation of the QI programme, and five[55 56 61 63 70] focused primarily on outcomes related to implementation measures.

The QI projects were distributed across different regions, with twelve projects taking place in North America, nine in Africa, seven in Europe and one in Asia. A total of 18 projects[43 46–48 50–55 61 63 65 67 69–71] were implemented across multiple sites, while 11 projects[44 45 49 57–60 62 64 66 68] were carried out at a single site. The QI projects were implemented in various healthcare settings, including hospitals (n=13),[44 45 49 52 55 57 60 62 64 66 68 71] primary care clinics (n=4),[43 59 67 69] specialised care centres (n=4),[54 56 58 61] or a combination of different facilities within or across health districts (n=8).[46–48 50 51 53 63 70] These projects addressed a diverse range of problems, reflecting the varied focus areas of QI efforts. Out of the 29 references, 22 discussed the utilisation of a QI framework to facilitate the rapid testing of small-scale interventions. Among these, 15 teams[43 47 51–53 55 58 59 61 65–67 69–71] employed PDSA ('plan, do, study, act') cycles, three[45 57 68] followed the Six Sigma framework, one[56] used SIDSSA ('Sustainable Improvement and Development through Strategic and Systematic Approaches') cycles, one[48] employed a clinical microsystems approach and two[49 62] adapted elements from various frameworks. The interventions developed to address gaps in healthcare, whether at a local or large-scale level, exhibited a range of approaches.

Table 1 also provides an overview of the decision-makers involved in the QI projects, categorised as either local (eg, managers and directors) or regional (eg, district managers, regional administrators and national policy decision-makers) actors. Out of the 29 projects, 17 described the involvement of local decision-makers

Table 1 Quality improvement (QI) project characteristics

Authors	Country	Setting (number)	Problem	Improvement framework	QI objective
Arbour *et al*[43]	USA	Primary care (5)	Maternal depression, intimate partner violence (IPV) and social needs	PDSA cycles	In five sites, 75% of infants and their families will receive all recommended well-child visits on time
Brush *et al*[44]	USA	Hospital (1)	Suboptimal cardiac surgery outcomes	None described	Improve cardiac surgery outcomes through practice standardisation
Chowdhury *et al*[58]	UK	Specialised (1)	Service users or their carers feel they are not given enough information	PDSA cycles	Improve communication between mental health team and service users, families and carers
Davies *et al*[45]	Ireland	Hospital (1)	Inefficiencies in nursing care and suboptimal work conditions	LSS	Optimise nursing time and improve personalised care and staff satisfaction
Doherty *et al*[46]	South Africa	Multiple institutions in one district	High rates of mother-to-child HIV transmission	None described	Scale up programme to prevent mother-to-child HIV transmission
Gage *et al*[47]	Zimbabwe	Multiple institutions (30) in five districts	Suboptimal maternal, newborn and child health services	PDSA cycles	Improve the quality of maternal, newborn and child health services
Gerrish *et al*[48]	UK	Multiple institutions	Risk of falls among elderly population and fall-related injury	Clinical micro-systems approach	Improve quality of care within the falls pathway
Haraden and Leitch[71]	Scotland	Hospital (9)	High rate of surgical mortality	Model for improvement (PDSA cycles)	Improve care quality (person-centred, safe and effective) for acute care patients
Hill *et al*[49]	USA	Hospital (1)	High rate of staff injury on inpatient child/adolescent psychiatric unit	► I2S2 ► System of profound knowledge ► PDSA cycles	Reduce staff injury related to patient interactions in inpatient child/adolescent psychiatric unit
Iyengar *et al*[50]	India	Multiple institutions (44) in 10 districts	Gaps in the quality of childbirth services for institutional deliveries	None described	Improve quality of childbirth services public service facilities
Jaribu *et al*[51]	Tanzania	Multiple institutions (27) in two regions	Elevated maternal and neonatal morbidity and mortality	► Breakthrough series collaborative ► PDSA cycles	Increase the rate of facility-based deliveries and improve the quality of perinatal care
Magge *et al*[70]	Ethiopia	Multiple institutions in four regions	Elevated rate of maternal and infant mortality	PDSA cycles	Improve maternal and child health and reduce maternal and infant mortality
Mahomed *et al*[52]	South Africa	Hospital (8)	High rate of healthcare associated infections	PDSA cycles	Implement a paper-based surveillance system for ICUs to measure healthcare-associated infections
Mate *et al*[53]	South Africa	Multiple institutions (161) in 18 health districts	High rate of mother-to-child HIV transmission	Model for improvement (PDSA cycles)	Improve the quality of antenatal care and prevent mother-to-child HIV transmission
Meehan *et al*[54]	USA	Specialised facilities (5)	High rate of hospital readmissions within 30 days postdischarge	None described	Decrease the rate of avoidable hospital readmissions

Continued

Table 1 Continued

Authors	Country	Setting (number)	Problem	Improvement framework	QI objective
Needleman *et al*[55]	USA	Hospital (67)	Suboptimal safety, reliability and patient-centredness of inpatient care	PDSA cycles	Improve quality and efficiency of inpatient care and support more effective teamwork
Nyström *et al*[56]	Sweden	Specialised facilities in two municipalities	Suboptimal elder care and care for children with functional impairments	SIDSSA	Improve care knowledge and capabilities of service providers
Parikh *et al*[57]	USA	Hospital (1)	Inefficiencies in ambulatory surgery	Six Sigma (DMAIC)	Increase patient satisfaction, improve quality of care and increase efficiency of patient flow related to ambulatory surgery
Radwan *et al*[59]	UK	Primary care (1)	Inequity in the diabetes care and diabetes outcomes	PDSA cycles	Improve measurable diabetes-clinical outcomes in marginalised ethnic communities
Raman *et al*[60]	USA	Hospital (1)	Inefficiencies in adolescent scoliosis operations	None described	Improve perioperative efficiency in adolescent idiopathic scoliosis
Sermersheim *et al*[62]	USA	Hospital (1)	High incidence of hospital acquired injuries related to devices placed around the nares	'RUSH Way' (combines PDCA, Six Sigma, Lean)	Reduce the incidence of nares acquired pressure injuries (NAPIs) to 3%
Rocker *et al*[61]	Canada	Multiple institutions (78) across 10 provinces	Suboptimal COPD care and burden of disease for patients and health systems	PDSA cycles	Improve COPD care quality and patient-centredness
Rubenstein *et al*[69]	USA	Primary care (3) in three regions	Suboptimal quality of depression care	PDSA cycles	Implement research-based collaborative care for depression
Shi *et al*[68]	Taiwan	Hospital (1)	Elevated rate of surgical site infections	Six Sigma (DMAIC)	Reduce the surgical site rates by 20%
Taylor *et al*[63]	UK	Multiple institutions (10)	Suboptimal breast cancer care	None described	Improve multi-disciplinary team breast cancer care
Villarreal *et al*[64]	USA	Hospital (1)	Delays in procedure start times in radiology	None described	Improve efficiency and reduce delays in radiology start times
Waiswa *et al*[65]	Uganda	Hospital (6)	High rate of adverse birth outcomes	PDSA cycles	Improve the quality of maternal and neonatal care in hospitals
Welch *et al*[66]	USA	Hospital (1)	Burden of medically complex patients in neonatal intensive care units, and diminished collaboration and care continuity	PDSA cycles	Improve collaboration and continuity of care, decrease length of stay and improve parent satisfaction
Yapa *et al*[67]	South Africa	Primary care (7)	High rate of mother-to-child HIV transmission	PDSA cycles	Improve antenatal HIV care

COPD, chronic obstructive pulmonary disease; DMAIC, Define, Measure, Analyse, Improve, Control; ICU, intensive care unit; I2S2, Intermediate Improvement Science Series; LSS, Lean Six Sigma; PDSA, plan, do, study, act; SIDSSA, Sustainable Improvement and Development through Strategic and Systematic Approaches.

Table 2 The roles decision-makers played in the QI projects

Authors	QI project initiator	Local QI project leader(s)	Decision-maker level	Decision-makers' roles and contributions
Arbour *et al*[43]	Non-government organisation	Local QI team	Regional	Insufficient detail
			Local	Clinic administrator: collaborator ► Member of local implementation team
Brush *et al*[44]	Local actor(s)	Local QI team	Local	Administrators: collaborator ► Member of Data Committee and Quality Committee, which initiated and led the project
Chowdhury *et al*[58]	Not specified	Local decision-maker	Local	Team manager, deputy manager and administrative manager: collaborators ► Participated in weekly meetings and PDSA cycles
Davies *et al*[45]	Not specified	Local QI team	Local	Hospital CEO and director of nursing (supporter and consultant) ► Project sponsor, consulted about the strategy
Doherty *et al*[46]	Regional decision-maker(s)	Regional QI teams	Regional	District programme managers: collaborator ► Participated in assessment, training workshops, feedback sessions, implementation and monitoring
			Local	Unit managers and clinic supervisors: collaborator ► Participated in assessment, training workshops, feedback sessions, implementation and monitoring
Gage *et al*[47]	Regional decision-maker(s)	Local QI team	Regional	Ministry of Health and Child Care: initiator ► Initiated the national programme, made QI a priority District managers: supporter ► Trained and supported to implement QI
			Local	Managers: collaborator ► Led the programme within each of the facilities
Gerrish *et al*[48]	Non-government organisation	Local QI team	Regional	Insufficient detail
			Local	Clinical managers: collaborator ► Member of meso-level and macro-level implementation groups Service managers: collaborator ► Involved in macro-level group for the achieving change phase
Haraden and Leitch[71]	Regional decision-maker(s)	Local decision-maker	Regional	Local health boards: supporter ► Supported clinician buy-in, participated in leadership walk-arounds Scottish overnment: initiator ► Contributed to measurement plan
			Local	Managers: collaborator ► Led local QI projects
Hill *et al*[49]	Not specified	Local QI team	Local	Nursing director: collaborator ► Member of QI team
Iyengar *et al*[50]	Regional decision-maker(s)	Not specified	Regional	State government: initiator ► Recruit of participants District health officers and state managers: supporter ► Provided report cards on project progress
			Local	Not specified

Continued

Table 2 Continued

Authors	QI project initiator	Local QI project leader(s)	Decision-maker level	Decision-makers' roles and contributions
Jaribu *et al*[51]	Regional decision-maker(s)	QI facilitator	Regional	District managers: collaborator ► Participated in QI workshops, named 'collaborators'
			Local	Insufficient detail
Magge *et al*[70]	Regional decision-maker(s)	Local QI team	Regional	Federal Ministry of Health: initiator ► Involved in improvement target and project selection, initiated and planned the initiative at the national level
			Local	Facility managers: collaborator ► Multidisciplinary team members
Mahomed *et al*[52]	Researchers	Researchers	Regional	Department of Health Provincial Infection Prevention and Control Unit and senior management: supporter ► Provided support to QI teams
			Local	Senior management and clinical manager: consultant ► Consulted for planning and intervention approval Nursing manager: consultant and supporter ► Consulted for planning, intervention approval, provided feedback, supported training
Mate *et al*[53]	Regional decision-maker(s)	Project leader	Regional	National Department of Health: initiator ► Initiated the national strategy District managers: supporter ► Designated participants, planned the project, participated in district review meetings
			Local	Facility managers: insufficient detail ► Involved in local execution of the QI project
Meehan *et al*[54]	Non-government organisation	QI facilitators	Regional	Not described
			Local	Administrators and nursing managers: supporter ► Asked for support, attended QI training, offered technical assistance
Needleman *et al*[55]	Non-government organisation	Local QI team ► Nursing unit	Regional	Insufficient detail
			Local	Unit managers: collaborator ► Attended or led the QI meetings, some were members of the QI leadership team Administrators and department heads: collaborator (some sites) ► Some participated in hospital level teams, some were members of the QI leadership team
Nyström *et al*[56]	Regional decision-maker(s)	Local decision-maker(s)	Regional	Division managers: collaborator ► Participated in meetings and workshops, oversaw change and implementation support
			Local	Unit managers: collaborator ► Participated in meetings and workshops, oversaw change and implementation support
Parikh *et al*[57]	Not specified	Local decision-maker(s)	Local	Administrators: collaborator ► Member of the leadership team
Radwan *et al*[59]	Regional decision-maker	Local QI team	Local	Managers: collaborator ► Codesigned the interventions, participated in QI training, implementation team member, facilitated reviews

Continued

Table 2 Continued

Authors	QI project initiator	Local QI project leader(s)	Decision-maker level	Decision-makers' roles and contributions
Raman *et al*[60]	Local actor(s)	QI facilitator	Local	Senior executives and nurse managers: collaborator ► Provided training, participated in QI meetings, helped align goals, assessed needs, developed the intervention
Sermersheim *et al*[62]	Local actor(s)	Local QI team	Local	Nursing manager: collaborator ► Member of the QI team, codesign the project, participated in practice evaluation
Rocker *et al*[61]	Non-government organisation	Local QI team	Regional	Insufficient detail
			Local	Nurse managers: collaborator ► Member of local QI team
Rubenstein *et al*[69]	Researchers	Researchers	Regional	Regional director: collaborator ► Endorsed the project, participated in intervention design and in PDSA cycles
			Local	Clinical and administrative leaders: collaborator ► Participated in implementation and PDSA cycles
Shi *et al*[68]	Local actor(s)	Local QI team	Local	Managers at the general affairs office: collaborator ► Member of the QI team Dean and hospital administrators: supporter ► Approved improvement processes, supported implementation, provided the necessary resources
Taylor *et al*[63]	Regional decision-makers	Local decision-maker	Regional	Integrated care system (ICS) administrator: initiator and supporter ► Introduced the programme, received weekly updates
			Local	Managers and administrators: initiator and supporter ► Introduced the programme, identified champions, received weekly updates
Villarreal *et al*[64]	Local actor(s)	QI facilitator	Local	Manager and nurse manager: collaborator ► Member of the QI team, participated in assessment, planned and implemented interventions
Waiswa *et al*[65]	Non-government organisation	Local QI team	Regional	Health system managers, district health officers, minister of health obstetricians: collaborator ► Participated in health system managers meetings, codesigned the intervention, reviewed findings, assisted with implementation
			Local	Medical superintendents, hospital administrators, unit managers: collaborator ► Participated in health system managers meetings, assisted with intervention selection, reviewed findings, assisted with implementation
Welch *et al*[66]	Local actor(s) ► Clinician researchers	Local QI team	Local	Medical director of the NICU: consultant ► Consulted on the intervention and outcomes NICU nurse manager: collaborator ► Participated in QI meetings, collaborated on intervention development, reviewed results, proposed modifications

Continued

Table 2 Continued

Authors	QI project initiator	Local QI project leader(s)	Decision-maker level	Decision-makers' roles and contributions
Yapa *et al*[67]	Non-government organisations	QI facilitators	Regional	Insufficient detail
			Local	Clinic operational managers: collaborator ► Provided guidance regarding the selection of improvement targets, some attended QI team meetings

NICU, neonatal intensive care unit; PDSA, plan, do, study, act; QI, quality improvement.

exclusively, 10 projects involved both regional decision-makers and local decision-makers, and 2 projects described the involvement of only regional decision-makers, not local decision-makers. Looking at the 18 multi-site projects, 10 described the involvement of both regional and local decision-makers, while 4 focused on local decision-makers and 2 focused only on regional decision-makers.

Involvement of decision-makers

Table 2 describes the characteristics of the papers in terms of the roles of various actors and especially the involvement of decision-makers. Regarding the initiation of the QI project, we observed a diverse range of actors involved. Notably, out of the 18 multi-site projects, regional decision-makers initiated 10,[46 47 50 51 53 56 59 63 70 71] while non-government partners (either academic or health professional entities) or QI organisations initiated 7.[43 48 54 55 61 65 67] Among the 11 single-site projects, local actors, such as QI teams or health professionals, initiated 6 projects.[44 60 62 64 66 68] In four instances, however, the references provided insufficient detail to determine who initiated the projects.[45 49 57 58] We also observed a diverse range of actors involved in local project leadership. Local QI teams or teams of health professionals led 14 of the 29 projects,[43–45 47 48 55 59 61 62 65 66 68 70] local decision-makers led 5,[56–58 63 71] QI facilitators led 5,[51 54 60 64 67] researchers led 2,[52 69] a project leader led 1,[53] regional QI teams led 1[46] and 1 provided insufficient detail to determine.[50]

Decision-maker roles

In table 2, we also provide a comparison of the roles and contributions of local and regional decision-makers. This enabled our illustration of the degree of collaboration and the details provided regarding the nature of their collaboration. Local decision-makers' contributions were documented in 27 of the 29 projects and regional decision-makers' contributions were documented in 12. Based on these documented contributions and following the conceptual framework (described above), we categorised the roles played by regional and local decision-makers as: initiator, supporter, consultant and collaborator.

In 7 out of 12 projects,[47 49 50 53 63 70 71] regional decision-makers were the initiators of the QI projects. Their activities included strategic planning and preparation for implementation[47 50 53 70]; recruitment, delegation and coordination of teams[50 63]; assessment and definition of indicators.[71] Regional decision-makers played supportive roles in six projects.[45 47 50 52 63 71] Their supportive activities consisted of advocacy and sponsorship[71]; implementation support[47 52]; and participation in review meetings and progress feedback.[50 53 63] Regional decision-makers were not described as having played a consultative role in any of the projects. Finally, in 5 of 12 projects,[46 51 56 65 69] regional decision-makers played a collaborative role, participating actively in QI activities[46 51 56 65 69]; and helping with implementation and change management.[46 56]

In most projects that described the involvement of local decision-makers, 22 of 27,[43 44 46–49 55–62 64–71] they acted as collaborators and regular members of the QI team. They contributed to assessment and planning[62 64 65]; actively participated in QI activities[46 49 58 62 64]; led and coordinated teams[47 55 57 58 60 67 71]; helped with implementation and change management[46 56 64 65 69]; and supported capacity building.[59 60 62] In three projects,[45 52 66] local decision-makers were described as having been consulted for defining the strategy, intervention and outcomes. Their involvement included strategic planning and preparation for implementation[45 52 66]; assessment[52]; and approval of QI project components.[52] Local decision-makers acted as supporters in five projects,[45 52 54 63 68] engaging in advocacy and sponsorship[45]; offering technical assistance and support[54 68]; and providing training and skill development.[52 54] Finally, in one project[63] we considered local decision-makers to have played the role of initiator, in which they were described as having introduced the QI programme and identified project champions.

Engagement strategies, advantages of collaboration and challenges

None of the references explicitly described a strategy for including decision-makers as consistent collaborators throughout the QI projects, and only one of the references[48] employed a QI framework intended to foster stakeholder engagement (ie, clinical microsystems approach). In many of the projects, local decision-makers were members of the QI team. The range of expected or observed benefits of involving decision-makers in QI projects, categorized as follows, were discussed in 15 of

the 29 texts (supportive quotes provided in online supplemental appendix III).

- Promote cooperation and shared learning[44]: collaboration with decision-makers encouraged a spirit of cooperation and helped foster an environment conducive to shared learning, leadership and problem-solving.
- Enhance frontline staff buy-in[44 69 71]: involvement of decision-makers was considered pivotal in gaining the buy-in of frontline staff.
- Support decision-makers' sense of ownership and accountability[46 59]: decision-makers involvement helped motivate their contribution toward the project's success.
- Secure resources and support[45 70]: decision-makers play a role in advocating among senior management to secure financial investment. Decision-makers' participation can also facilitate the enactment of policies that are favourable to QI.
- Enable more effective leadership[47 53 56 57 70]: decision-makers' involvement can deepen their understanding of frontline staff perceptions and the operational realities of their facilities.
- Ensure feasibility and successful implementation[65 67]: decision-makers' in-depth understanding of the organisation's capabilities and constraints helps to ensure that projects are feasible and adapted to the organisation's needs. Their endorsement (or authorisation) is considered to be critical.

In 14 of 29 references, (supportive quotes provided in online supplemental appendix III), the authors discussed challenges or identified facilitators or barriers to QI implementation that concerned decision-makers' involvement or their roles. These are listed below.

- Time constraints and support from senior management[46 52 54 67]: frontline managers had time commitments preventing their participation in QI. Senior management support was considered critical in enabling frontline managers' participation.
- Variable expertise and quality of supervision[47 50 56 61]: lack of managerial experience and training hindered optimal facilitation and implementation. Investment in the development of managerial skills and ensuring the provision of high-quality supervision and monitoring was considered essential.
- Centralised leadership[47 51 52 63]: highly centralised approaches potentially hinder the sense of ownership among frontline managers and staff and impact QI project acceptability. Balanced leadership that encourages active participation at all levels is recommended.
- Communication and stakeholder relationships[57 61 63]: poor stakeholder relationships can result in participation issues and contribute to the adoption of more centralised approaches. Regular and effective communication between stakeholders can enhance the success and sustainability of QI projects.
- Alignment of objectives and strategies[66]: discrepancies between managerial strategies and the QI project can hinder adequate adaptation of the project to the operational realities and the provision of required resources. Ensuring synergy between managerial and frontline staff's priorities and implementation plans is considered essential.

The results of this scoping review provide insight into the range of roles decision-makers have played in QI projects and highlight the importance of their involvement in securing the project's success. While the advantages such as mutual learning, frontline staff buy-in, accountability, resource allocation, effective leadership and feasible implementation are evident, issues related to time constraints, supervisory expertise, centralised leadership, stakeholder relationships and strategic alignment pose significant challenges. These findings set the stage for an in-depth discussion on their implications for the design and implementation of QI projects.

DISCUSSION

This scoping review was conducted with the objectives of identifying QI projects within published literature that involved decision-makers and describing the roles they played. We included decision-makers of all levels in our review and contrasted the roles played by local and regional decision-makers. To the best of our knowledge, this is the first scoping review to identify references that describe QI projects which include decision-makers. It was motivated by evidence suggesting that the success of QI projects often hinges on decision-makers' continuous collaboration, and the apparent lack of literature discussing how they were successfully involved. While our review did not identify any formal engagement strategies in the texts we retained, it does provide important insights into decision-makers' roles and advantages and challenges associated with their involvement and gives rise to recommendations for collaboration with decision-makers.

We observed variation between the roles of local and regional decision-makers. Regional decision-makers commonly initiated and supported QI projects, playing a role in strategic planning, capacity building, implementation support and feedback mechanisms. Occasionally, they acted as consultants or collaborators, in which they actively participated in QI processes and supported change management. Conversely, local decision-makers were predominantly collaborators, contributing significantly to planning, coordination, implementation, change management and capacity building. They also periodically functioned as consultants and supporters, engaging in strategic planning, assessments, technical support and skill development. While the variability in roles demonstrates adaptability in QI projects, suboptimal engagement frequently hinders successful and sustained implementation, as many authors have noted.[12 17 20] As highlighted in our review, issues such as insufficient resources, limited time, and conflicting goals and strategies are obstacles to successful QI implementation. Furthermore, the quality

of relationships between frontline staff and decision-makers is strained by poor communication, deficient QI support and non-collaborative leadership styles, which can exacerbate QI team disengagement.[47 51 57 63] Addressing these challenges and leveraging the reported benefits of decision-maker engagement could significantly improve the effectiveness and sustainability of QI initiatives.

The results of this review point to the necessity of developing practical engagement and communication strategies that foster a spirit of collaboration between frontline staff, decision-makers at all levels and other stakeholders. Our review highlights the importance of adopting less centralised leadership styles that embrace input from stakeholders and foster a sense of ownership among all involved. Given recommendations in the literature that decision-makers play a collaborative role in QI projects and evidence suggesting their involvement is critical to success,[12 14 15 17 20] we expected engagement strategies to be well documented. However, none of the references described engagement strategies, and few provided rationale for their involvement or a discussion of the impact of their involvement on implementation. The scarcity of documented engagement strategies points to a significant opportunity for future research. Future research should evaluate techniques for fostering ongoing engagement and effective communication and collaboration with stakeholders throughout the project lifecycle, and strategies for reconciling stakeholders' different priorities and expectations. A deeper understanding of engagement mechanisms and collaboration strategies is essential for ensuring the success and sustainability of QI projects.

The review also revealed differences in the documentation of decision-maker involvement between single-site and multi-site QI projects. These differences primarily centred around the focus and level of detail provided. Single-site projects generally provided more detail about local processes and stakeholders, whereas multi-site projects tended to offer more detail about the larger QI initiative and provided less detail about how local teams functioned and collaborated. In multi-site projects, details regarding rapid testing of interventions were less often provided. The lack of uniformity in reporting between multi-site and single-site projects restricted our in-depth comparison of decision-makers roles across different types of QI projects. Our observations corroborate the assertion that more detailed documentation of local processes is needed regarding multi-site projects,[72] so that we might gain insight into local decision-makers' contributions considering these typically centralised implementation strategies.

Limitations

This study encountered several limitations. First, in terms of data sources, we primarily focused our search within research journals. We searched several additional sources for QI reports, but we did not identify any text that met our criteria for the documentation of decision-makers' involvement. We acknowledge that QI differs from traditional research and that the texts we retained may not fully reflect the spectrum of QI efforts in practice. The texts we included may be more skewed toward presenting QI in the context of research, such as evaluation of the outcomes of QI implementation, or identification of implementation barriers and facilitators. To capture a more comprehensive picture of QI efforts, broader search strategies that include additional grey literature sources may be warranted for future research. Second, our search strategy identified texts that used terms more commonly associated with QI (eg, 'quality improvement', PDSA, define-measure-analyse-improve-control, Lean, Six Sigma, rapid cycle, etc). Studies that did not employ this specific terminology might have been missed; however, we do not consider the number of missed studies to be significant. Third, to identify decision-makers, we employed several terms in our search strategy (eg, decision-maker, policy-maker, manager, administrator). We did not include terms such as 'directors', 'ministers of health', 'CEOs' or 'health authorities'. As our search identified 14 675 references after duplicates were removed, broadening our search would not have been feasible. Finally, in our search for texts, we used the documentation of participatory research as a frame of reference, which typically emphasises stakeholders' contributions. Consequently, we expected that abstracts would explicitly mention the involvement of decision-makers. However, given the importance of decision-makers' involvement, we do not believe that those we excluded in this way would have involved the active participation of decision-makers.

CONCLUSION

This scoping review provides important insights into decision-makers' contributions to QI projects. Recognising their vital role in the success of these initiatives, this paper uncovers the various roles played by decision-makers, the benefits and challenges associated with their involvement, and identifies opportunities for strengthening their involvement. Addressing barriers such as limited resources, time constraints, and conflicting priorities, healthcare organisations can better capitalise on decision-makers' participation in QI projects. We emphasise the need for practical engagement and communication strategies that foster collaborative stakeholder partnerships. Future studies should focus on developing and evaluating explicit and actionable strategies for engaging decision-makers in QI processes to further enhance QI outcomes.

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ORCID iD

Justin Gagnon http://orcid.org/0000-0002-4852-8846

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Appendix I. Quality Improvement and Decision-Maker Search Strategy

MEDLINE (OVID)

#	Query	Results from April 4, 2022
1	"Quality improvement"/	30,574
2	(Quality adj3 improv*).tw.	183,201
3	(pdsa or plan-do-study-act or "plan do study act" or pdca or plan-do-check-act or "plan do check act" or define-measure-analyze-improve control or dmaic or dmadv or define-measure-analyze-design-verify).tw.	2,421
4	((lean adj manufacturing) or (lean adj production) or (lean adj healthcare) or (lean adj health adj care) or (lean adj health adj service) or (lean adj healthcare adj service) or (lean adj health adj care adj service) or (inventive adj problem adj solving) or (inventive adj problem-solving) or (inventive adj problem solving) or (business adj process adj reengineering) or (business adj process adj re-engineering) or (system* adj redesign)).tw.	604
5	((iterative adj cycle) or (rapid adj cycle) or (small adj test adj2 change)).tw.	655
6	(deming or taguchi or kansei or kaizen or (toyota adj production adj system)).tw.	2,177
7	(six-sigma or (six adj sigma) or "total quality management" or (quality adj function adj deployment) or (quality adj circle) or (quality adj cycle)).tw.	1,953
8	(policy-maker* or policymaker* or decisionmaker* or decision-maker*).tw.	61,920
9	(administrator* or manager*).tw.	81,017
10	1 or 2	198,463
11	3 or 4 or 5 or 6 or 7	7,514
12	10 or 11	203,451
13	8 or 9	137,897
14	12 and 13	7,218
15	limit 14 to yr="2002 -Current"	6,319
16	limit 15 to (english or french)	6,145

CINAHL (EBSCO)

#	Query	Results from April 4, 2022
S17	S12 AND S13 (English or French) AND 2002-2022, Exclude MEDLINE	1,654
S16	S12 AND S13 (English or French) AND 2002-2022	2,813
S15	S12 AND S13 (English or French)	3,068
S14	S12 AND S13	3,121
S13	S8 OR S9	82,864
S12	S10 OR S11	72,878
S11	S3 OR S4 OR S5 OR S6 OR S7	3,905
S10	S1 OR S2	70,964
S9	(TI administrator* OR AB administrator*) OR (TI manager* OR AB manager*)	56,724
S8	(TI policy-maker* OR AB policy-maker*) OR (TI policymaker* OR AB policymaker*) OR (TI decisionmaker* OR AB decisionmaker*) OR (TI decision-maker* OR AB decision-maker*)	28,735
S7	((TI six-sigma OR AB six-sigma)) OR ((TI six OR AB six) W1 (TI sigma OR AB sigma)) OR ((TI "total quality management" OR AB "total quality management")) OR ((TI quality OR AB quality) W1 (TI function OR AB function) W1 (TI deployment OR AB deployment)) OR ((TI quality OR AB quality) W1 (TI circle OR AB circle)) OR ((TI quality OR AB quality) W1 (TI cycle OR AB cycle))	1,445
S6	(TI deming OR AB deming) OR (TI taguchi OR AB taguchi) OR (TI kansei OR AB kansei) OR (TI kaizen OR AB kaizen) OR ((TI toyota OR AB toyota) W1 (TI production OR AB production) W1 (TI system OR AB system))	406
S5	((TI iterative OR AB iterative) W1 (TI cycle OR AB cycle)) OR ((TI rapid OR AB rapid) W1 (TI cycle OR AB cycle)) OR ((TI small OR AB small) W1 (TI test OR AB test) N2 (TI change OR AB change))	451
S4	((TI lean OR AB lean) W1 (TI manufacturing OR AB manufacturing)) OR ((TI lean OR AB lean) W1 (TI production OR AB production)) OR ((TI lean OR AB lean) W1 (TI healthcare OR AB healthcare)) OR ((TI lean OR AB lean) W1 (TI health OR AB health) W1 (TI care OR AB care)) OR ((TI lean OR AB lean) W1 (TI health OR AB health) W1 (TI service OR AB service)) OR ((TI lean OR AB lean) W1 (TI healthcare OR AB healthcare) W1 (TI service OR AB service)) OR ((TI lean OR AB lean) W1 (TI health OR AB health) W1 (TI care OR AB care) W1 (TI service OR AB service)) OR ((TI inventive OR AB inventive) W1 (TI problem OR AB problem) W1 (TI solving OR AB solving)) OR ((TI inventive OR AB inventive) W1 (TI problem-solving OR AB problem-solving)) OR ((TI inventive OR AB inventive) W1 (TI problem solving OR AB problem solving)) OR ((TI business OR AB business) W1 (TI process OR AB process) W1 (TI reengineering OR AB reengineering)) OR ((TI business OR AB business) W1 (TI process OR AB process) W1 (TI re-engineering OR AB re-engineering)) OR ((TI system* OR AB system*) W1 (TI redesign OR AB redesign))	444
S3	(TI pdsa OR AB pdsa) OR (TI plan-do-study-act OR AB plan-do-study-act) OR (TI "plan do study act" OR AB "plan do study act") OR (TI pdca OR AB pdca) OR (TI plan-do-check-act OR AB plan-do-check-act) OR (TI "plan do check act" OR AB "plan do check act") OR (TI define-measure-analyze-improve control OR AB define-measure-analyze-improve control) OR (TI dmaic OR AB dmaic) OR (TI dmadv OR AB dmadv) OR (TI define-measure-analyze-design-verify OR AB define-measure-analyze-design-verify)	1,376
S2	Quality N3 (TI improv* OR AB improv*)	17,187
S1	(MH "Quality improvement")	62,473

EMBASE (OVID)

#	Query	Results from April 4, 2022
1	"Quality improvement"/	48,631
2	(Quality adj3 improv*).tw.	261,291
3	(pdsa or plan-do-study-act or "plan do study act" or pdca or plan-do-check-act or "plan do check act" or define-measure-analyze-improve control or dmaic or dmadv or define-measure-analyze-design-verify).tw.	5,846
4	((lean adj manufacturing) or (lean adj production) or (lean adj healthcare) or (lean adj health adj care) or (lean adj health adj service) or (lean adj healthcare adj service) or (lean adj health adj care adj service) or (inventive adj problem adj solving) or (inventive adj problem-solving) or (inventive adj problem solving) or (business adj process adj reengineering) or (business adj process adj re-engineering) or (system* adj redesign)).tw.	788
5	((iterative adj cycle) or (rapid adj cycle) or (small adj test adj2 change)).tw.	936
6	(deming or taguchi or kansei or kaizen or (toyota adj production adj system)).tw.	3,149
7	(six-sigma or (six adj sigma) or "total quality management" or (quality adj function adj deployment) or (quality adj circle) or (quality adj cycle)).tw.	2,437
8	(policy-maker* or policymaker* or decisionmaker* or decision-maker*).tw.	68,414
9	(administrator* or manager*).tw.	82,217
10	1 or 2	280,240
11	3 or 4 or 5 or 6 or 7	12,583
12	10 or 11	287,770
13	8 or 9	145,407
14	12 and 13	9,088
15	limit 14 to yr="2002 -Current"	8,431
16	limit 15 to (english or french)	8,220

PSYCHINFO (OVID)

#	Query	Results from June 8 2023
1	"Quality improvement"/	0
2	(Quality adj3 improv*).ti,ab.	31,136
3	(pdsa or plan-do-study-act or "plan do study act" or pdca or plan-do-check-act or "plan do check act" or define-measure-analyze-improve control or dmaic or dmadv or define-measure-analyze-design-verify).ti,ab.	293
4	((lean adj manufacturing) or (lean adj production) or (lean adj healthcare) or (lean adj health adj care) or (lean adj health adj service) or (lean adj healthcare adj service) or (lean adj health adj care adj service) or (inventive adj problem adj solving) or (inventive adj problem-solving) or (inventive adj problem solving) or (business adj process adj reengineering) or (business adj process adj re-engineering) or (system* adj redesign)).ti,ab.	441
5	((iterative adj cycle) or (rapid adj cycle) or (small adj test adj2 change)).ti,ab.	102
6	(deming or taguchi or kansei or kaizen or (toyota adj production adj system)).ti,ab.	318
7	(six-sigma or (six adj sigma) or "total quality management" or (quality adj function adj deployment) or (quality adj circle) or (quality adj cycle)).ti,ab.	935
8	(policy-maker* or policymaker* or decisionmaker* or decision-maker*).ti,ab.	38,895
9	(administrator* or manager*).ti,ab.	96,895
10	1 or 2	31,136
11	3 or 4 or 5 or 6 or 7	1,973
12	10 or 11	32,729
13	8 or 9	131,306
14	12 and 13	2,511
15	limit 14 to yr="2002 -Current"	2,194
16	limit 15 to (english or french)	2,134

Appendix II. Expanded Tables Displaying the Extracted Data

Table 1. QI project characteristics (expanded)

Authors	Country	How QI is documented	Setting	Problem	Scope	Improvement Framework	QI Objective	Change Strategies	Observed Change	Decision-Makers Involved
Arbour et al. 2021	United States	Retrospective description of QI program and outcomes	Primary care (5)	Maternal depression, intimate partner violence (IPV), and social needs	Multi	PDSA cycles	In five sites, 75% of infants and their families will receive all recommended well-child visits on time	DULCE (Developmental Understanding and Legal Collaboration for Everyone): • Linking families with infants to needed resources	• High proportion of families screened for health-related social needs • High proportion of families provided information about resources • Increase in the percentage of families who completed well-child visits on time	Regional: • Not specified Local: • Clinic administrator
Brush et al. 2006	United states	Retrospective description of QI program and outcomes	Hospital (1)	Suboptimal cardiac surgery outcomes	Single	None described	Improve cardiac surgery outcomes through practice standardization	• Data for percutaneous coronary intervention and cardiac surgery are collected • Performance reports are reviewed and methods for improving performance are implemented	• Improvements in several cardiac surgery indicators	Local: • Administrators
Chowdhury et al. 2020	United Kingdom	Retrospective description of QI program and outcomes	Specialized (1) • Community mental health team	Service users or their carers feel they are not given enough information	Single	PDSA cycles	Improve communication between mental health team and service users, families, and carers	• Medication leaflets for clinicians, • Diagnostic leaflets for clinicians • Amendment of clinician letters • Mandatory diary updating • Structured information entry	• Increase in service user satisfaction • Reduction in complaints	Local: • Team manager • Deputy manager • Team administrative manager
Davies et al. 2019	Ireland	Retrospective description of QI program and outcomes	Hospital (1)	Inefficiencies in nursing care and suboptimal work conditions	Single	Lean Six Sigma (LSS)	Optimize nursing time and improve personalized care and staff satisfaction	• Streamlining documentation • Visual indicator for refreshment needs, • Increasing patient capacity • Team-building	• Service performance • Patient satisfaction • Staff satisfaction. • Reduction in patient turnaround time • Increase in nursing care time • Improvement of nurse-patient ratio	Local: • Hospital CEO • Director of Nursing
Doherty et al. 2009	South Africa	Retrospective description of QI program and outcomes	Multiple institutions in one district	High rates of mother-to-child HIV transmission	Multi	None described	Scale up program to prevent mother-to-child HIV transmission	PMTCT (prevent mother-to-child transmission) programme: • Routine offer of antenatal counselling and testing • Infant feeding counselling • Nevirapine for mothers and infants	• Increase in rate of antenatal and PCR testing • Uptake of infant nevirapine	Regional: • District programme managers Local: • Unit managers • Clinic supervisors

								• Infant PCR testing • Free formula for women choosing not to breastfeed		
Gage et al. 2022	Zimbabwe	Retrospective description of QI program and outcomes and factors associated with implementation	Multiple institutions (30) in 5 districts • Primary care • Hospitals	Suboptimal maternal, newborn and child health services	Multi	PDSA cycles	Improve the quality of maternal, newborn, and child health services	Capacity building to conduct QI	• Improvement in postnatal care process measures • Improvement in maternal care process measures	Regional: • District managers • Ministry of Health and Child Care Local: • Managers
Gerrish et al. 2018	United Kingdom	Retrospective description of QI program and outcomes and factors associated with implementation	Multiple institutions • Primary care • Hospitals • Other service providers	Risk of falls among elderly population and fall-related injury	Multi	Clinical micro-systems approach	Improve quality of care within the falls pathway	Integrated care pathway for falls: • Screening • Risk assessment • Multidisciplinary diagnosis of unexplained falls • Patient information • Enhanced data collection • Improved staff communication, coordination and role clarification • Referral process redesign	• Optimization of various aspects of the pathway • Collaboration between frontline staff and decision-makers from different services within the pathway was achieved	Regional: • Not specified Local: • Clinical managers • Senior clinical managers • Service managers
Haraden et al. 2011	Scotland	Description of QI program and intermediate outcomes	Hospital (9)	High rate of surgical mortality	Multi	Model for Improvement (PDSA cycles)	Improve care quality (person-centered, safe and effective) for acute care patients	Capacity building to conduct QI	• Decrease in mortality rate	Regional: • Clinical managers • Local health boards • Government Local: • Managers
Hill et al. 2015	United States	Retrospective description of QI program and outcomes	Hospital (1)	High rate of staff injury on inpatient child/adolescent psychiatric unit	Single	• Intermediate Improvement Science Series (I2S2) • System of profound knowledge • PDSA cycles	Reduce staff injury related to patient interactions in inpatient child/adolescent psychiatric unit	• Precautionary measures • Standardized assessment • Protective equipment • Team huddles • Leadership rounds • Incident reviews • Safe handoff • Patient information binders • Patient identification board	• Reduction in injuries	Local: • Nursing director
Iyengar et al. 2014	India	Retrospective description of QI program and outcomes	Multiple institutions in 10 districts • Public health facilities (44)	Gaps in the quality of childbirth services for institutional deliveries	Multi	None described	Improve quality of childbirth services public service facilities	• Capacity building to conduct QI • Evidence based practice recommendations	• Reduction of unnecessary or harmful practices during labor, delivery and postpartum (in most facilities)	Regional: • State government • District health officers and State Managers

								• Staff received training		Local: • Not specified
Jaribu et al. 2015	Tanzania	Retrospective description of QI program and outcomes	Multiple institutions (27) in 2 regions • Health centres • Dispensaries	Elevated maternal and neonatal morbidity and mortality	Multi	• Breakthrough series collaborative • (PDSA cycles)	Increase the rate of facility-based deliveries and improve the quality of perinatal care	• Improved monitoring and detection of problems at childbirth • Counselling of pregnant women	• Increase in facility-based deliveries • Increase in number of partographs to monitor labor progress	Regional: • District managers Local: • Not specified
Magge et al. 2019	Ethiopia	Description of QI program and intermediate outcomes and QI implementation measures	Multiple institutions in four regions within in one district • Public health facilities	Elevated rate of maternal and infant mortality	Multi	PDSA cycles	Improve maternal and child health and reduce maternal and infant mortality	• National quality strategy • QI collaborative infrastructure • Capacity building to conduct maternal and newborn health QI	• Numerous maternal and newborn health change ideas were tested • A change package was developed with 83 successfully tested change ideas	Regional: • Federal Ministry of Health • Regional Health Bureaus Local: • Facility managers
Mahomed et al. 2017	South Africa	Retrospective description of QI program and outcomes and factors associated with implementation	Hospital (8) • Intensive Care Units	High rate of healthcare associated infections	Multi	PDSA cycles	Implement a paper-based surveillance system for ICUs to measure healthcare-associated infections	Surveillance system for monitoring and preventing healthcare-associated infections in ICUs	• Surveillance system implementation faced numerous challenges and was not successfully achieved	Regional: • Department of Health Provincial Infection Prevention and Control Unit Local: • Senior management • ICU nursing manager • Clinical manager
Mate et al. 2013	South Africa	Retrospective description of QI program and outcomes	Multiple institutions (161) in 18 health districts • Health care facilities	High rate of mother-to-child HIV transmission	Multi	Model for improvement (PDSA cycles)	Improve the quality of antenatal care and prevent mother-to-child HIV transmission	A-Plan (Accelerated plan): • Increase the number of pregnant women in antenatal care • Strengthen preventative services at health-care facilities	• Tracking of processes in the prevent mother-to-child transmission program was established	Regional: • National Department of Health • District managers Local: • Facility managers
Meehan et al. 2015	United States	Retrospective description of QI program and outcomes and factors associated with implementation	Specialized facilities (5) • Skilled nursing facilities	High rate of hospital readmissions within 30 days post-discharge	Multi	None described	Decrease the rate of avoidable hospital readmissions	INTERACT (Interventions to Reduce Acute Care Transfer): • Improve identification, evaluation, and management of acute changes in residents' conditions • Implement tools to support these aims	• INTERACT tools implemented in all facilities • Hospital readmission rates decreased in two facilities	Regional: • Not specified Local: • SNF Administrator • Director of Nursing
Needleman et al. 2016	United States	Retrospective description of QI program and QI implementation measures	Hospital (67)	Suboptimal safety, reliability and patient-centredness of inpatient care	Multi	PDSA cycles	Improve quality and efficiency of inpatient care and support more effective teamwork	• QI collaborative infrastructure • QI capacity building	• Aspects of the QI project implemented in all participating hospitals • A large proportion of teams succeeded in conducting tests of change	Local: • Unit managers • Nursing administrators • Physician administrators • Department heads
Nyström et al. 2018	Sweden	Retrospective description of QI program and QI implementation measures	Specialized facilities in two municipalities • Specialized care residences	Suboptimal elder care and care for children with functional impairments	Multi	SIDSSA (development and action-learning loops)	Improve care knowledge and capabilities of service providers	• Multi-level QI capacity building strategy	• Aspects of the QI intervention implemented in the participating settings • Participants' perceptions of the approach were favorable	Regional: • Division managers Local: • Unit managers

Parikh et al. 2021	United States	Retrospective description of QI program and outcomes	Hospital (1)	Inefficiencies in ambulatory surgery	Single	Six Sigma (DMAIC)	Increase patient satisfaction, improve quality of care, and increase efficiency of patient flow related to ambulatory surgery	• Better define and optimize staff roles • Improve communication between operating room staff	• Some (but not all anticipated) improvements to workflow were observed	Local: • Administrators
Radwan et al. 2020	United Kingdom	Retrospective description of QI program and outcomes	Primary care (1)	Inequity in the diabetes care and diabetes outcomes	Single	PDSA cycles	Improve measurable diabetes-clinical outcomes in marginalized ethnic communities	• Information gathering • Pharmacist education • Process optimization	Outcomes • Improvements to care processes • All treatment targets for patients with diabetes	Local: • Managers
Raman et al. 2022	United States	Retrospective description of QI program and outcomes	Hospital (1) • Pediatric hospital	Inefficiencies in adolescent scoliosis operations	Single	None described	Improve perioperative efficiency in adolescent idiopathic scoliosis	CUSP (Comprehensive Unit-based Safety Program) • Increasing visibility of metrics for duration • Partnering with blood bank • Streamlining OR trays • Improving of OR setup and staffing	Outcomes • Increase in first case on-time start • Variance decrease for anesthesia ready time • Decrease in closure to patient out of room time	Local: • Senior executives • RN managers
Read Sermersheim et al. 2021	United States	Retrospective description of QI program and outcomes	Hospital (1)	High incidence of hospital acquired injuries related to devices placed around the nares	Single	"RUSH Way" (combines PDCA, Six Sigma, Lean)	Reduce the incidence of nares acquired pressure injuries (NAPIs) to 3%	Evidence-based nares acquired pressure injuries (NAPIs) preventive care bundle comprising an improved tube fastening system • hydrocolloid barrier • tube securement device • patient assessments • site checks	Outcomes • Reduction in nares acquired pressure injuries incidence rate	Local: • Manager from nursing department
Rocker et al. 2017	Canada	Retrospective description of QI program and outcomes and QI implementation measures	Multiple institutions (78) across 10 provinces • Acute care • Primary care • Home care	Suboptimal COPD care and burden of disease for patients and health systems	Multi	PDSA cycles	Improve COPD care quality and patient-centeredness	INSPIRED COPD Outreach Program: • Post-discharge follow-up • Psychosocial support • Access to support services	• Aspects of the QI intervention implemented to varying degrees • Many teams involved patients in customized care planning • Admissions, emergency room visits and costs decreased in some facilities • Teams reported gaining greater knowledge about COPD care	Regional: • Not specified Local: • Nurse managers
Rubenstein et al. 2010	United States	Description of QI program and	Primary care (3) in three regions	Suboptimal quality of depression care	Multi	PDSA cycles	Implement research-based collaborative	Translating Initiatives in Depression into Effective Solution (TIDES): • Pathway	Outcomes • Decrease in mean Patient Health Questionnaire (PHQ-9) scores	Regional: • Regional director Local:

		intermediate outcomes					care for depression	• Manager roles • Clinician roles • Informatics • Education	• Care managers referred 28% of TIDES patients to mental health specialty	• Clinical and administrative leaders
Shi et al. 2022	Taiwan	Retrospective description of QI program and outcomes	Hospital (1)	Elevated rate of surgical site infections	Single	Six Sigma (DMAIC)	Reduce the surgical site rates by 20%	• Strengthen leadership support system • Perioperative risk assessment • Standardize perioperative protocols • Healthcare information feedback system • Environmental cleaning audit system	• Decrease in surgical site infections	Local: • Managers of the general affairs office • Dean and hospital administrators
Taylor et al. 2021	United Kingdom	Retrospective description of QI program and outcomes QI implementation measures	Multiple institutions (10) • Integrated Care Centres	Suboptimal breast cancer care	Multi	None described	Improve multi disciplinary team breast cancer care	Multi Disciplinary Team (MDT) Fit Program: • Assessment and feedback programme	• All teams within the care centers participated in the implementation of MDT-FIT • Moderate fidelity • High acceptability • Moderate adoption • High appropriateness • Low cost • High feasibility	Regional: • Integrated care system (ICS) director Local: • Managers • Administrators
Villarreal et al. 2015	United States	Retrospective description of QI program and outcomes	Hospital (1) • Radiology Department	Delays in procedure start times in radiology	Single	None described	Improve efficiency and reduce delays in radiology start times	• Checklist for treatment room handoff • Redefinition of transport responsibility • Timing of blood draw modified • Consent performed by fellows • Lab results made accessible via internet	• Increase in number of on-time starts • Reduction in patient wait times • Reduction in delay duration • Reduction in subsequent patient care delays	Local: • Manager • Nurse manager
Waiswa et al. 2021	Uganda	Retrospective description of QI program and outcomes	Hospital (6)	High rate of adverse birth outcomes	Multi	PDSA cycles	Improve the quality of maternal and neonatal care in hospitals	Standardized package that included: • Training • equipment and data collection • clinical mentorship • Support for improved clinical audits • Support for continuous leadership engagement	• Neonatal Care Units in maternity units institutionalized, as well as kangaroo mother care spaces, resuscitation corners, and MPDRs in the maternity units • Reduction in maternal and neonatal mortality rates	Regional: • Health system managers • District health officers • Minister of Health Obstetricians Local: • Medical superintendents • hospital administrators • Neonatal care unit managers
Welch et al. 2017	United States	Retrospective description of QI program and outcomes	Hospital (1)	Burden of medically complex patients in neonatal intensive care units, and diminished collaboration and care continuity	Single	PDSA cycles	Improve collaboration and continuity of care, decrease length of stay, and improve parent satisfaction	Care Collaboration for Babies with Extended Stays (CBES): • Weekly multidisciplinary team meetings to discuss long term plans for patients	Outcomes • Reduction in duration of hospitalization	Local: • NICU Medical director • NICU Nurse manager

Yapa et al. 2019	South Africa	Retrospective description of QI processes and outcomes and factors associated with implementation	Primary care (7)	High rate of mother-to-child HIV transmission	Multi	PDSA cycles	Improve Antenatal HIV care	MONARCH (Management and Optimisation of Nutrition, Antenatal, Reproductive, Child health and HIV care): • Viral load monitoring among pregnant women living with HIV • Repeat testing among women not living with HIV	• CQI not fully implemented and normalized • Patient tracking notebook and results filing system implemented • Viral load monitoring improved	Regional: • Not specified Local: • Clinic operational managers

Table 2. The roles decision-makers played in the QI projects (expanded)

Authors	QI project Initiator	Local QI project leader(s)	Decision-maker level	Decision-maker role	Decision-makers' documented contributions	Observed benefits of decision-maker involvement	Observed challenges with decision-maker involvement
Arbour et al. 2021	Non-government organization • Center for the Study of Social Policy (CSSP)	Local QI team	Regional	Insufficient detail	Not specified	None described	None described
			Local	Collaborator	Clinic administrator: • Member of local implementation team		
Brush et al. 2006	Local actor(s) • Data committee • Quality committee	Local QI team • Data committee • Quality committee	Local	Collaborator	Administrators: • Member of Data Committee and Quality Committee • Responsibilities included launching, coordinating, and institutionalizing QI methods • Quality committee initiated and led the project.	• Collaboration with decision-makers promoted a sustained spirit of cooperation • Collaboration supported shared learning, leadership and problem solving • Decision-maker involvement helped gain physician buy-in	None described
Chowdhury et al. 2020	Not specified	Local Decision-Maker • Team manager	Local	Collaborator	Team manager, deputy manager, and team administrative manager: • Weekly meetings to brainstorm ideas, plan tests of change, review progress and define courses of action • The team measured baseline data, established the design and theory change and participated in PDSA cycles.	None described	None described
Davies et al. 2019	Not specified	Local QI team • Nursing division staff	Local	Hospital CEO • Supporter • Consultant Director of Nursing • Supporter • Consultant	Hospital CEO • Project sponsor • Consulted for defining the strategy Director of Nursing • Project champion • Consulted for defining the strategy	• Senior management involvement and financial investment considered crucial	None described
Doherty et al. 2009	Regional team (including regional decision-makers) • Programme managers • Unit managers • Clinic supervisors	Regional QI teams • District and sub-district coordinators • Supervisors	Regional	Collaborator	District programme managers • Participated in the assessment phase task team • Participated in training workshops and feedback sessions • Gained skills in programme assessment • Helped identify gaps and define goals and action plans • Participated in implementation and monitoring	• Participatory approach enabled mid level managers to see how their facilities functioned and take ownership	• Support from senior district management critical to enabling middle management participation
			Local	Collaborator	Unit managers and clinic supervisors • Participated in the assessment phase task team • Participated in training workshops and feedback sessions • Helped identify gaps and define goals and action plans • Participated in implementation and monitoring		
Gage et al. 2022	Regional decision-maker • Ministry of Health and Child Care	Local QI team • CQI teams	Regional	Ministry of Health and Child Care • Initiator District managers • Supporter	Ministry of Health and Child Care • Initiated the national program which comprised the QI pilot • Made QI a priority District managers	• Leadership, teamwork and joint decision-making considered enabling factors • Supportive supervision from district authority was considered motivating	• Some participants viewed the QI project as a top-down intervention • Quality of supervision and mentoring varied between districts

					• Trained and supported to implement QI		• National QI projects require strategies at all levels (macro, meso and micro)
			Local	Collaborator	Managers • Received coaching to carry out QI activities • Led the program within each of the facilities • Consulted and engaged staff in identifying factors, monitoring results, and decision making		
Gerrish et al. 2018	Non-government organization • Teaching Hospitals and healthcare partners	Local QI team • Nurse • Facilitators	Regional	Insufficient detail	Not specified	None described	None described
			Local	Collaborator	Clinical managers • Involved in meso level group for the change initiation phase • Involved in macro level group for the achieving change phase Service managers • Involved in macro level group for the achieving change phase		
Haraden et al. 2011	Regional decision-maker • Government health directorate	Local decision-maker • Program manager • Executive leader	Regional	Local health boards • Supporter Scottish government • Initiator	Local health boards • Recruited to get clinician buy-in. • Participated in leadership walk-arounds Scottish government • Worked with IHI on a measurement plan to gather data for run charts	• Leadership involvement considered key to clinician buy-in and local initiatives being adequately supported	None described
			Local	Collaborator	Managers • Received QI training alongside leaders and clinicians • Collaborated with government on aligning goals • Led local QI projects		
Hill et al. 2015	Not specified	Local QI team • Project team	Local	Collaborator	Nursing director • Member of QI team • The team established the goals, collected and interpreted data, identified and implemented strategies	None described	None described
Iyengar et al. 2014	Regional team (including regional decision-makers) • State Government • Action Research & Training for Health • United Nations Population Fund	Not specified	Regional	• Initiator • Supporter	State Government Medical, Health & Family Welfare Department • Collaborated with partners on identifying facilities and developing the initiative • Sent letters of invitation to participating facilities • Participated in workshops on the role of evidence based care District health officers and State Managers • Received report cards and attended annual review meetings • Participated in workshops on the role of evidence based care	• Close collaboration with state and district level decision makers from the design stage considered crucial to building consensus and sustaining QI	• Better monitoring by district authority would have better supported practice change
			Local	Insufficient detail	Not specified		
Jaribu et al. 2015	Regional decision-maker • Ministry of health Health, and Social Welfare • Mtwara Rural and Ruangwa Council Health	QI Facilitator	Regional	Collaborator	District managers • Participated in QI workshops • Included as “collaborators”	None described	• Directives from district managers and local managers’ limited influence hindered acceptability and sustainability
			Local	Insufficient detail	Not specified		

	Management Teams (CHMT) • Ifakara Health Institute (IHI) staff • Improving New-born Survival in Southern Tanzania (INSIST) team						• District managers must support local managers prioritize QI • District managers received external support for 18 months then support was withdrawn
Magge et al. 2019	Regional decision-maker • Ministry of Health • Institute for Healthcare Improvement (IHI)	Local QI team • Multi disciplinary teams	Regional	Initiator	Federal Ministry of Health • Partnered with the Institute for Healthcare Improvement (IHI) to identify opportunities for improvement • Consulted regarding the selection of five prototype collaboratives • Initiated and planned the initiative at the national level	• The Minister of Health's leadership in the design and implementation was considered a major enabling factor • Ministry of health investment and incorporation of the QI strategy into central policy considered key • Learning sessions helped link health system actors with community members to advance patient-centered care	None described
			Local	Collaborator	Facility managers • Served as members on each of the collaboratives' multidisciplinary teams • Assisted with the development of action plans to addressed gaps including clinical training		
Mahomed et al. 2017	Researchers	Researchers	Regional	Supporter	Department of Health Provincial Infection Prevention and Control Unit and senior management • Provided support to the ICUs in their conduct of QI	None described	• Local managers did not take ownership of the process nor maintain adequate oversight • Nursing managers were often occupied with their other duties
			Local	Senior management, clinical manager • Consultant Nursing manager • Consultant • Supporter	Senior management • Consulted for planning • Participated in review meeting to decide if the surveillance system should be adopted Nursing manager • Consulted for planning • Approved the tool prior to implementation • Provided feedback from evaluation of the surveillance system • Participated in review meeting to decide if the surveillance system should be adopted • Ensured the night staff received training Clinical manager • Consulted for planning • Met with principle investigator to review patient charts • Approved the tool prior to implementation • Participated in review meeting to decide if the surveillance system should be adopted		
Mate et al. 2013	Regional decision-maker • South Africa National Department of Health • Prevention of mother-to child HIV transmission (PMTCT) Directorate	Project leader	Regional	National Department of Health • Initiator District managers • Supporter	National Department of Health • Initiated the national strategy District managers • Designated NGOs to participate • Planned the QI project • Participated in monthly district review meetings	• District managers' involvement at early stages and project leadership considered key success factors • Ownership by National department of health leaders was considered essential	None explicitly discussed
			Local	Insufficient detail	Facility managers • Involved in local execution of the QI project		

Meehan et al. 2015	Non-government organization • Connecticut Quality Improvement Organization	QI Facilitators	Regional	Insufficient detail	Not described	None explicitly discussed	• Many leaders approached declined to participate due to lack of time
			Local	Supporter	Administrators and nursing managers • Asked to give their support • Some attended QI training sessions • Offered technical assistance		
Needleman et al. 2016	Non-government organization • Robert Wood Johnson Foundation (RWJF) • American Organization of Nurse Executives (AONE)	Local QI team • Nursing unit	Regional	Insufficient detail	Not described	None explicitly discussed	• Leaders were encouraged to create hospital level teams to support QI teams, but they did in less than a third of sites
			Local	Unit managers • Collaborator Other decision-makers • Collaborator (some sites)	Unit managers • Attended or led the regular meetings • Some were also members of a leadership team that discussed reports from unit managers, tests of change and sustainability Nursing administrators, physician administrators, department heads • Participated in hospital level teams (some sites) • Member of leadership team that discussed reports from unit managers, tests of change and sustainability (some sites)		
Nyström et al. 2018	Regional team (including regional decision-makers) • Researchers • Public health agency	Local decision-maker • Division managers • Unit managers	Regional	Collaborator	Division managers • Participated in meetings and workshops • Responsible for overseeing change and aiding staff with implementation	• Strategic management involvement, coaching, and working with managerial colleagues enhanced the observed change and learning processes	• Managers could have benefitted from guidance regarding micro-strategies • When involvement of division managers decreased, progress slowed
			Local	Collaborator	Unit managers • Participated in meetings and workshops • Locally responsible for overseeing change and aiding staff with implementation		
Parikh et al. 2021	Not specified	Local decision-maker • Administrators	Local	Collaborator	Administrators • Member of the leadership team	• Leadership involving each stakeholder considered success factor	• Lack of continuous reinforcement contributed to resistance and slowed progress • Participation issues, inefficient communication, and insufficient organizational buy-in
Radwan et al. 2020	Regional decision-maker • National Health Service	Local QI team • Multi-disciplinary teams	Local	Collaborator	Managers • Co-designed interventions • Participated in QI training program • Member of the implementation team • Facilitated recalls and reviews to be undertaken by clinical staff	• Managers and staff played a role, giving the whole team a sense of ownership	None explicitly discussed
Raman et al. 2022	Local actor(s) • Attending surgeon	QI Facilitator	Local	Collaborator	Senior executives and nurse managers • Provided training • Attended regular meetings • Assisted with the alignment of goals, assessment of needs and development of interventions	None explicitly discussed	None explicitly described
Read Sermersheim et al. 2021	Local actor(s) • QI team	Local QI team	Local	Collaborator	Nursing manager • Member of the QI team • Co-designed the project charter and plan • Participated in practice evaluation and identification of gaps	None explicitly discussed	None explicitly described

					• Helped ensure that education was institutionalized		
Rocker et al. 2017	Non-government organization • Foundation for Healthcare Improvement	Local QI team • QI team • Foundation for Healthcare Improvement	Regional	Insufficient detail	Not specified	None explicitly discussed	• Lack of experience and training hindered optimal facilitation and implementation of program components • Benefits of the collaborative not fully realized due to minimal communication between leadership and partner organizations
			Local	Collaborator	Nurse managers • Members of local QI teams		
Rubenstein et al. 2010	Researchers	Researchers	Regional	Collaborator	Regional director • Endorsed the project • Reviewed collaborative care literature provided by the research team • Participated in the design of the intervention as member of design panel • Participated in PDSA cycles	• Support from primary care and mental health leadership at all levels considered critical • Buy-in from managers responsible for resource allocation considered critical	• Leadership involvement did not persist
			Local	Collaborator	Clinical and administrative leaders • Implemented the interventions • Participated in PDSA cycles		
Shi et al. 2022	Local actor(s) • QI team	Local QI team	Local	Managers at the general affairs office • Collaborator Dean and hospital administrators • Supporter	Managers at the general affairs office • Member of the QI team Dean and hospital administrators • Approved and enforced the policies and improvement processes • Supported implementation • Provided the necessary resources	None explicitly discussed	None explicitly described
Taylor et al. 2021	Regional decision-makers • Integrated care system (ICS) management	Local decision-maker • Integrated care system (ICS) administrator • Cancer managers • Hospital administrators	Regional	• Initiator • Supporter	Integrated care system (ICS) administrator • Coordinated hospital cancer managers and administrators • Introduced the program to local teams • Received weekly updates from the teams	None explicitly discussed	• Poor stakeholder relationships resulted in a more centralized approach to implementation • Centralized approach hindered a sense of ownership • The choice by the ICS not to engage hospital based managers and administrators led to a staggered implementation
			Local	• Initiator • Supporter	Managers and administrators • Introduced the program • Identified project champions • Received weekly updates		
Villarreal et al. 2015	Local actor(s) • Radiology department	QI Facilitator • Vice chair of quality	Local	Collaborator	Manager and nurse manager • Member of the QI team • Participated in mapping patient workflow and defining metrics • Planned and implemented interventions	• Interdisciplinary multi-level approach provided complimentary insight and supported buy-in at different levels	None explicitly discussed
Waiswa et al. 2021	Non-government organization • The World Health Organization (WHO)	Local QI team • Hospital teams led by maternity nurse in charge	Regional	Collaborator	Health system managers, District health officers, Minister of Health Obstetricians • Participated in health system managers meetings • Co-designed the intervention	• Collaboration between facilities helped establish a regional care network	None explicitly discussed

					• Reviewed findings from baseline survey and identified priority interventions for implementation • Participated in the development, implementation, and evaluation of the project interventions	• Involvement of managers helped ensure feasibility as they knew what would work in their facilities • Managers' endorsement of interventions helped ensure their successful implementation	
			Local	Collaborator	Medical superintendents, hospital administrators, unit managers • Participated in health system managers meetings • Co-designed the intervention • Reviewed findings from baseline survey and identified priority interventions for implementation • Assisted with the implementation		
Welch et al. 2017	Local actor(s) • Clinician researchers	Local QI team	Local	Medical director of the NICU • Consultant NICU nurse manager • Collaborator	Medical director of the NICU • Consulted on the intervention and primary outcomes NICU nurse manager • Participated in multidisciplinary team meetings (clinical and QI) • Collaborated on the development of the intervention • Discussed interim results and planned and implemented modifications	None explicitly discussed	• QI team's decisions can conflict with manager's plans
Yapa et al. 2019	Non-government organizations • NHS foundation trust • Clinicians • Researchers • QI facilitators	QI Facilitators	Regional	Insufficient detail	Not specified	• Involvement of the operational manager considered essential for authorizing activity	• Time commitments limited operational manager involvement and subsequently delayed improvement activities
			Local	Collaborator	Clinic operational managers • Guided clinic teams within each facility to identify areas for improvement and test solutions • Attended CQI team meetings in some settings		

Appendix III. Illustrative Examples and Quotes

Table 3. Illustrative Examples of Local and Regional Decision-Makers' Contributions by Type of Role

	Local Decision-Makers	Regional Decision-Makers
Initiator	"MDT-FIT was designed to be coordinated by cancer managers/administrators within individual hospitals. For this implementation study this role was undertaken by an ICS administrator (non-clinical), managed by the ICS Director." "The ICS administrator was advised to visit each breast multidisciplinary team to introduce them to MDT-FIT and was also advised to identify a local [...] 'champion' that could help support engagement and coordination in each hospital." [1]	"This intervention titled "Parijaat" was designed by Action Research & Training for Health, in partnership with the state government and United Nations Population Fund." ""Parijaat", emerged as a collaborative initiative for improving the quality of facility based delivery services as a result of consultations between representatives of the state government's Medical, Health & Family Welfare Department, UNFPA, UNICEF and Action Research & Training for Health (ARTH), a notfor-profit organization." "The state government issued a letter to all participating facilities, positioning the intervention as being one for quality improvement." [2]
Supporter	"A QIO staff [...] mailed a recruitment letter to each SNF Administrator or Director of Nursing. [...] The letter emphasized the national focus on reduction of preventable hospital readmissions and Medicare's strategies [...]. Next, 2 other QIO staff members [...] placed follow-up phone calls [...] to request a face-to-face meeting with the Administrator, the Director of Nursing, and the Medical Director to discuss the project, answer questions, and obtain leadership commitment to participate." "Then, QIO personnel made 1-3 phone calls to the Directors of Nursing Services and the Administrators of each SNF to schedule on-site recruitment visits. Leaders at 7 facilities agreed to meet with QIO staff to discuss the project." [3]	"The implementation of the surveillance system for HAIs in ICUs received strong support from the KwaZulu-Natal Department of Health Provincial Infection Prevention and Control Unit and senior management at each of the hospitals." [4]
Consultant	"The intervention and primary outcomes for this project were developed initially in consultation with the medical director of the NICU." [5] Welch et al.	None described
Collaborator	"The stakeholders involved were the team manager and deputy manager, the team consultant, the team specialist registrar, team administrative manager, two carers and one service user. [...]The team organised weekly meetings to brainstorm ideas, plan tests of change to review progress and to agree on the next course of action." "The team attended the service user forum [...] The team developed a theory of change as a driver diagram [...] Plan, Do, Study, Act (PDSA) cycles involved the testing of posters in clinical spaces, follow-up phone calls to service users and the amendment of clinic letters.[...] The project team developed a forcefield analysis to identify the factors supporting and restraining people from adopting this change idea." [6]	"Participatory assessment phase - District programme managers gain skills in programme assessment: • Training workshop on assessment framework and tools [...] • Formation of teams of 3-4 people • Complete assessment of PHC facilities [...] • Collection of routine data [...]" "Feedback and planning phase - District managers identify areas of weakness and learn to set realistic targets and action plans: • Review of assessment results at a workshop • Identification of areas of weakness • Target setting and action plans" "Implementation and monitoring phase - Team agrees on an action plan to address programme weakness [...]: • Planned interventions implemented [...] • Development of further action plans" [7]

Table 4. Selected Excerpts Highlighting the Advantages of Decision-Maker Involvement in QI Projects

Advantages Described	Quote
Promote cooperation and shared learning	"Over the years, hospital administration and key physician leaders have managed to promote a sustained spirit of cooperation." [8] "These committees [two committees consisting of high-level individuals to launch, coordinate and institutionalize CQI] offer an opportunity for shared learning, leadership, and problem solving." [8]
Enhance frontline staff buy-in	"Over the years, hospital administration and key physician leaders have managed to promote a sustained spirit of cooperation. The chair of each committee is physician, and the agenda is focused on clinical performance and not individual financial performance. The agenda of meetings primarily focuses on hospital wide performance and induces all parties to buy into the concept of improving overall systems of care." [8] "To be successful, TIDES required support from both primary care and mental health leadership at multiple levels (region, medical center, and local practice). Buy-in from the managerial levels that control resource allocation was also critical" [9] "Scotland's local health boards were recruited to convince hospital staff and patients that safety was a priority." [10]
Support decision-makers' sense of ownership and accountability	"The advantages of a participatory approach are that the process of conducting the assessments enables mid level managers to see first hand how well their facilities are functioning and to take ownership of the findings since it is data that they themselves have collected." [7] "Clinical pharmacists, administrative assistants and practice managers played a role in the implementation and delivery. Overall, this QI programme enabled a sense of ownership by the whole practice team." [11]
Secure resources and support	"The involvement of senior management and their commitment to investing the initial costs of a LSS project were crucial to the progress of the project." [12] "A critical factor in the successful implementation of the prototype phase has been the FMoH's leadership of the design and implementation at all levels. The impetus for program design came from the FMoH in alignment with the Quality and Equity transformation agenda laid out in Ethiopia's HSTP." [13] "The deep engagement of the FMoH and incorporation of the QI strategy into central policy and planning were major guarantors of survival of the program during periods of instability and change." [13]
Enable more effective leadership	"Enabling factors included strengthened leadership, teamwork and joint decision-making at facilities, as well as and supportive supervision." [14] "Two notable achievements—rapid buy-in and project leadership by district managers, and collaboration of multiple supporting NGO partners—were responsible for early success of the intervention and provide a potential model for implementation of other large-scale programs in similar resource-constrained settings." [15] "In retrospect, including managers who were new in their role, and participants on the way to retirement, was not optimal. Nevertheless, strategic management involvement, coaching, and working with managerial colleagues enhanced the observed change and learning processes." [16] "Proper leadership involving each stakeholder, obtaining active feedback, and clearly explaining the goals of the project are key to any successful endeavor." [17] "Finally, we found learning sessions to be an effective way to link health system actors directly with community members to advance patient-centered care. During the last prototype learning sessions, community members vetted the change package and helped set priorities for future improvement activities." [13]
Ensure feasibility and successful implementation	"First, the designed interventions were feasible within the context because managers generally knew what would or would not work in their context. Second, the managers endorsed the interventions and thus were more willing to cooperate with the implementation and maintenance of those things that were deemed useful." [18] "The operational manager was essential for decision-making to start a new activity." [19]

Table 5. Selected Excerpts Highlighting the Challenges of Involving Decision-Makers in QI Projects

Challenges Described	Quote
Time constraints and support from senior management	"The disadvantages are that it relies on support and buy in from senior district management to allow mid level managers the time to participate in the workshops and to actually undertake the assessments. Without this support, the participatory approach would not succeed." [7] "Despite the intensive planning, stakeholder engagement, consultation and training of nursing staff, and support from management, the surveillance of HAIs in ICUs was not successful. The main reason for the failure of the surveillance could be attributed to human resource limitations." - [4] "Leaders from the 8 SNFs that did not meet with QIO staff either did not answer the QIO's initial phone calls or declined to participate, citing lack of time and competing priorities as their reasons." – [3] "Leaders from all 5 SNFs expressed appreciation for the training and technical assistance provided by the QIO. However, they also confirmed QIO staff observations that staff at these SNFs were extremely busy with patient care and administrative duties and that it was difficult for them to find time for quality improvement." – [3] "Operational manager unavailability due to other commitments delayed approval of improvement activities." [19]
Variable expertise and quality of supervision	"[…] the effectiveness of supportive supervision and mentoring from provincial and district levels was undermined by staff shortages at provincial and district levels and limited time spent at the health facilities. Providers noted that the quality of the coaching was often variable […] There were additional gaps in the quantity and quality of supervision and mentoring from the central level to the provinces and districts, which limited the ability of the districts to effectively coach the facilities." [14] "In particular, there appears to have been variation in the quality of supervision and limitations around the delivery of the CQI training that likely contributed to the heterogenous results." [14] "Greater monitoring of quality by district level authorities would help to bring about changes in practices such as postpartum monitoring and handwashing." [2] "Further guidance for unit managers and staff in moving forward to develop micro-strategies could be provided, in future work, through educational sessions based on the PDSA model, the use of iterative cycles, the need for small-scale and prediction-based testing of change, the use of data over time, and the value and best practices for documentation" [16] "The majority of programs reported staff problems that included time conflicts, where employees were unable to dedicate adequate time to the improvement efforts, lack of adherence to the strategies being implemented, lack of experience/training necessary to facilitate/implement components of planned programs, and lack of commitment to the program. " [20]
Centralized leadership	[…] fragmentation of quality assurance and improvement functions at national and provincial resulted in inefficiencies and ineffectiveness of interventions. Within the MHCC, quality improvement functions are distributed among different structural units with little coordination. This fragmentation is mirrored at lower levels such that CQI was perceived as another government program with dedicated people and resources, rather than a comprehensive and ingrained approach to quality improvement." [14] "Macro and meso level strategies are likely needed at the national, provincial and district levels in addition to the micro level strategies to improve overall health system quality." [14] "For both acceptability and sustainability, local leaders needed to spearhead the intervention. However, our direct involvement in driving the improvement work delayed the district managers accepting the intervention. This experience supports the suggestion from […] external assistance when developing QI approaches should focus on facilitation that supports local leadership to prioritise improvement projects and local health carer mentorship. [21]

	"While our results are promising, the extent to which the intervention has been sustained by the district managers is not known. It was made clear to the district managers up-front that the QI initiative would have external support from the project for 18 months, and thereafter they would need to take over implementation." [21] "In our study, the surveillance was being driven by the principal investigator, who was not a staff member of any of the hospitals. Although feedback was provided at regular intervals on the quality of data being collected, it was evident that hospitals need to take ownership of the surveillance." [4] "Feedback from some MDT members, however, indicated a lack of ownership of the decision to adopt MDT-FIT due to the centralized management of implementation." [1]
Communication and stakeholder relationships	"Six Sigma is a process that requires continuous reinforcement to be successful. Short-term goals can be easily achieved; however, gains made need to be sustained and the process needs to be continually monitored to ensure that old habits don't resurface." [17] "Second, employee engagement and active participation should have been encouraged. Staff satisfaction and burnout with the project should have been tracked with a dedicated channel for staff to express their opinions and concerns about the project. Both horizontal and vertical buy-in should have been obtained." [17] "Unfortunately, optimal results were not achieved due to participation issues, inefficient communication, and insufficient organizational buy-in." [17] "Leadership was the second largest challenge for many. This included stakeholder relationships and cross-organizational partnerships where communication was minimal." [20] "Although all 10 MDTs participated, this was perceived as mandatory by some, and often coupled with a lack of awareness of the potential benefits of participating." [1] "There also appeared to be an "inverse" relationship between stakeholder inter-relationships and change infrastructure: the poor stakeholder interrelationships (due to lack of engagement of individual team members as implementation was centralized) led to some team members perceiving that MDT-FIT was mandatory rather than optional." [1]
Alignment of objectives and strategies	"The other major challenge that we anticipated was that decisions made by the multidisciplinary group could be in conflict with management plans made by attending neonatologists." [5]

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