SUPPORTING ADVANCES IN QUALITY IN HEALTH SYSTEMS
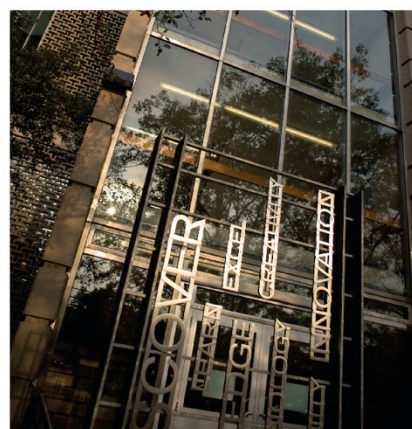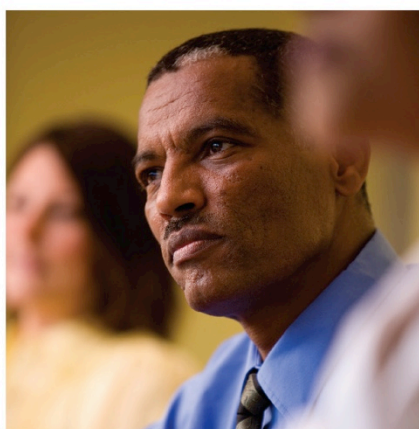
RAPID
SYNTHESIS
(30-DAY
RESPONSE)

28 OCTOBER 2016

EVIDENCE >> INSIGHT >> ACTION

Rapid Synthesis:
Supporting Advances in Quality in Health Systems

28 October 2016

McMaster Health Forum

For concerned citizens and influential thinkers and doers, the McMaster Health Forum strives to be a leading hub for improving health outcomes through collective problem solving. Operating at regional/provincial levels and at national levels, the Forum harnesses information, convenes stakeholders, and prepares action-oriented leaders to meet pressing health issues creatively. The Forum acts as an agent of change by empowering stakeholders to set agendas, take well-considered actions, and communicate the rationale for actions effectively.

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Timeline

Rapid syntheses can be requested in a three-, 10- or 30-business day timeframe. This synthesis was prepared over a 30-business day timeframe. An overview of what can be provided and what cannot be provided in each of the different timelines is provided on the McMaster Health Forum's Rapid Response program webpage.

Merit review

The rapid synthesis was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and system relevance.

Citation

Wilson MG. Waddell K, Hartman M, Sreeram P. Rapid synthesis: Supporting advances in quality in health systems. Hamilton, Canada: McMaster Health Forum, 28 October 2016.

KEY MESSAGES

Question
- What structures and processes can be used to support advances in quality in health systems?

Why the issue is important
- Many organizations that prioritize advancing quality in health systems focus on ensuring that care is safe, effective, patient-centred, timely, efficient and equitable.
- While the quality of healthcare has improved over time in many countries, provincial health systems in Canada are consistently in the middle or at the bottom in comparisons to these other countries.
- Agencies in Canada with a mandate to advance quality in the health systems in which they work typically focus on approaches to quality improvement (i.e., a systematic approach to improving clinical- and system-level quality and performance) and/or quality assurance (i.e., a more reactive approach that monitors whether standards of quality are being met).
- However, such agencies themselves must also continually evolve to ensure their structures and processes are optimally designed to achieve their mandate and strategic priorities.

What we found
- We found very limited evidence about the impacts of system-level efforts to advance quality, but a small number of systematic reviews point to some process-related benefits, including that: collaborative approaches have improved care processes, patient care and organizational performance; and patient- or clinician-driven efforts to improve quality have been found to be more effective than approaches driven by managers and policymakers.
- Agencies can draw on the following six levers for enhancing their efforts to advance quality in health systems (and the many systematic reviews that provide evidence about ways of operationalizing these levers): 1) focus on population health needs; 2) engaging front-line managers and providers in creating an improvement culture; 3) building organizational and system capacity; 4) creating supportive policies and incentives; 5) engaging patients and citizens; and 6) promoting evidence-informed decision-making.
- Our scan of agencies in Canadian provinces that are focused on advancing quality revealed that:
  - the mandates of most of the agencies are stated in broad terms, but a few are more specific (e.g., supporting public inquiries about the health system, optimizing prescribing practices, conducting health technology assessments, engaging with patients/citizens and enhancing population health);
  - several provincial agencies (Alberta, Ontario, New Brunswick, Nova Scotia and Newfoundland and Labrador) engage in activities that would be associated with both quality improvement (e.g., education) and quality assurance (e.g., publicly reporting on priorities in the system such as wait times), and within these groups Alberta and Ontario appear to have agencies that engage in the most comprehensive range of activities of all the other provinces that we scanned;
  - most agencies use some form of quality and safety monitoring system/approach, however some use a mix of other health-system arrangements (e.g., consumer- and stakeholder-engagement processes, supports for safe workplace conditions and patient safety, and the development of packages of care such as medicate management checklists);
  - at the programmatic level, the main approach used includes a variety of educational supports with many also providing supports for adopting evidence-based approaches, evaluating key priorities and for fostering collaboration within the system; and
  - only one agency (Health Quality Ontario) has an approach to evaluating their performance (at least that we could identify), which includes a scorecard to measure organizational progress on their key performance indicators.
- A scan of international agencies revealed notable differences to Canadian agencies, including that many deliver quality-improvement programs along with the development and/or enforcement of accreditation standards, and that some feature direct linkages between the quality-assurance body and the government (e.g., in New Zealand, Sweden and Germany, the mandate includes not only publishing information but a requirement to produce recommendations to the government for closing projects or programs).

QUESTION

- What structures and processes can be used to support advances in quality in health systems?

WHY THE ISSUE IS IMPORTANT

As noted by the Health Council of Canada in 2013, there are many definitions of quality in healthcare, but a common conception of it is "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge, as expressed through a set of dimensions of quality."(5) Many organizations focused on advancing quality in health systems (in Canada and internationally) also identify quality according to six aims, which relate to ensuring that care is safe, effective, patient-centred, timely, efficient and equitable.(5-7)

However, while the quality of healthcare has improved over time in many high-income countries, provincial health systems in Canada consistently range in the middle or at the bottom in comparisons to these other countries.(5;8)

Agencies in Canada with a mandate to advance quality in the health systems in which they work typically focus on approaches to quality improvement and/or quality assurance. While there are many definitions of quality improvement, one that has been used in Canada defines quality improvement "as a systematic approach to making changes that improve clinical practice and health system performance, enhance professional and/or organizational development, and improve patient and population health outcomes."(5;9;10) In contrast, quality assurance is often reactive and monitors whether standards of quality are being met.(11) In healthcare, this can include the "assessment or evaluation of the quality of care; identification of problems or shortcomings in the delivery of care; designing activities to overcome these deficiencies; and follow-up monitoring to ensure effectiveness of corrective steps."(12) In Canada, quality assurance is often overseen by professional regulatory colleges (which are not the focus of this rapid synthesis) but, as noted in findings related to the jurisdictional scan, some provincial quality agencies also undertake a limited array of quality-assurance activities. While such agencies draw on these types of approaches in their efforts to advance quality in health systems, the agencies themselves must also continually evolve to ensure their structures and processes are optimally designed to achieve their mandate and strategic priorities.

WHAT WE FOUND

We summarize our findings about structures and processes that can be used to support advances in quality improvement in health systems in three sections. First, we provide findings from the systematic reviews we identified that evaluate the impact of approaches to quality improvement, as well as one systematic review

Box 1: Background to the rapid synthesis

This rapid synthesis mobilizes both global and local research evidence about a question submitted to the McMaster Health Forum's Rapid Response program. Whenever possible, the rapid synthesis summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select and appraise research studies, and to synthesize data from the included studies. The rapid synthesis does <u>not</u> contain recommendations, which would have required the authors to make judgments based on their personal values and preferences.

Rapid syntheses can be requested in a three-, 10- or 30-business-day timeframe. An overview of what can be provided and what cannot be provided in each of these timelines is provided on the McMaster Health Forum's Rapid Response program webpage (http://www.mcmasterhealthforum.org/policyma kers/rapid-response-program).

This rapid synthesis was prepared over a 30-business day timeframe and involved four steps:
1) submission of a question from a health system policymaker or stakeholder;
2) identifying, selecting, appraising and synthesizing relevant research evidence about the question;
3) drafting the rapid synthesis in such a way as to present concisely and in accessible language the research evidence; and
4) finalizing the rapid synthesis based on the input of at least two merit reviewers.

about quality assurance and one program and system description/analysis. This section does not include findings related to specific quality-improvement or quality-assurance interventions (e.g., educational approaches, outreach, audit and feedback, financial incentives, regulations, etc.) given that there are more than 1,100 systematic reviews available about such interventions in Health Systems Evidence (www.healthsystemsevidence.org). Instead, the focus is on the small number of reviews we identified that focus on broader approaches to quality improvement and assurance that may draw on many of these interventions. Next, we provide a summary of six levers that can be used to help organizations accelerate quality improvement along with key findings from systematic reviews about these levers (where available). Lastly, we provide findings from a jurisdictional scan of agencies in Canadian provinces and in select Organisation for Economic Cooperation and Development (OECD) countries (Australia, Denmark, Germany, New Zealand, Northern Ireland, Scotland, Sweden, the United Kingdom and the United States) that have a mandate to advance quality in their health systems. To keep the scope of the review manageable, we focused only on those Canadian agencies with a province-wide focus that were not focused on a particular sector (e.g., cancer) or profession (e.g., regulatory colleges). In contrast to the first two sections, we draw on findings and insights from program and system descriptions/analyses that we identified from Health Systems Evidence and websites of the quality agencies included in the jurisdictional scan.

Box 2: Identification, selection and synthesis of research evidence

We identified research evidence for this synthesis by searching for systematic reviews of effects and systematic reviews addressing other types of questions in Health Systems Evidence (www.healthsystemsevidence.org). Specifically, we hand searched the systematic reviews of effects and systematic reviews addressing other types of questions included in the topic filters for "Quality monitoring and improvement systems" and for "Safety monitoring and improvement systems." We supplemented these searches by drawing on findings from four recent evidence briefs produced by the McMaster Health Forum.(1-4) For the jurisdictional scan of provincial and select OECD quality agencies, we conducted hand searches of the websites for each agency for relevant documents and reports about them.

The results from the searches were assessed by one reviewer for inclusion. A document was included if it fit within the scope of the questions posed for the rapid synthesis.

For each review we included in the synthesis, we documented the focus of the review, key findings, last year the literature was searched (as an indicator of how recently it was conducted), methodological quality using the AMSTAR quality appraisal tool (see the Appendix for more detail), and the proportion of the included studies that were conducted in Canada. We then used this extracted information to develop a synthesis of the key findings from the included reviews and primary studies.

Evidence about the impact of approaches to quality improvement and assurance

In general, we found very limited evidence about the impacts of system-level efforts to advance quality, but a small number of systematic reviews point to some process-related benefits, which we highlight below. We supplement these findings with components of high-performing health systems that have been identified from the literature and through engagement with citizens and health-system stakeholders. In contrast, we have identified a large volume of evidence that could be used in efforts to draw on the six levers that could be used to accelerate quality improvement.

As noted above, we found very limited evidence about the impact of system-level approaches to advance quality, but we did identify: five older systematic reviews and one recent review that evaluated approaches to quality improvement (as opposed to specific interventions, which we provide high-level findings about in the next section); one older review focused on quality assurance (although this review is written in German so detailed data extraction was not possible); and two program and system description/analyses of system-wide efforts to improve quality.

One older medium-quality review found that collaborative quality-improvement interventions have contributed to improvements in processes of care, patient care and organizational performance.(13) Another older but low-quality review found that patient- or clinician-driven quality improvement was more effective than approaches driven by managers or policymakers.(14) Lastly, two older reviews (one of medium quality

and one of low quality) found several contextual factors that were associated with quality-improvement success, which include:

- leadership from top management;
- a supportive organizational culture (including support of board members);
- availability of data infrastructure and information systems (in this case, cancer registries);
- experience with or years involved in quality improvement;
- physician involvement;
- motivation to change;
- sufficient resources;
- effective team leadership; and
- use of multifaceted interventions.(15;16)

One of these reviews also noted that key limitations for quality-improvement success were a lack of a practical conceptual model, a lack of clear definitions of contextual factors, and a lack of well-specified measures.(15) The review that focused on quality assurance was written in German, but the English abstract indicated that the review was more aligned with interventions normally associated with quality improvement and found that a minimum caseload, the use of guidelines and continuing medical education show positive effects on the outcomes of care.(17)

One of the program and system descriptions/analyses that we identified examined three systems (in Alaska, Utah and Sweden) that have achieved high levels of performance by using system-wide efforts to improve quality.(9) The analysis identified 10 themes that underpinned the creation of sustained high performance. This work was recently expanded upon through a review of international literature and through citizen- and stakeholder-engagement processes in Canada, which provided an updated list of key attributes of high performing healthcare systems, which include (note these are extracted directly from the report):

1) focusing on quality and system improvement as the core strategy;
2) developing leadership skills;
3) enhancing system governance;
4) investing in capacity to support improvement;
5) improving accountability and performance measurement;
6) enabling comprehensive information infrastructures;
7) strengthening primary care;
8) improving integration and care transitions;
9) enhancing professional cultures and engaging clinicians;
10) engaging patients, caregivers and the public;
11) attending to access and equity issues; and
12) considering population health and chronic-disease management in care-management strategies.

Noteworthy in this list is that it contains attributes that would be common to not only quality improvement (e.g., focusing on it as a core strategy, developing leadership skills, investing in capacity, enhancing professional cultures and engaging clinicians, patients, caregivers and the public), but also quality assurance (most notably improving accountability and performance measurement and enabling comprehensive information infrastructures).

The analysis of the three high-performing systems further notes that there have been difficulties in Canada for creating and sustaining large-scale advancements in quality, and that there are many challenges to supporting the replication and spread of local initiatives, which has meant that innovative models are often limited in scale. Given this, the analysis points to the need to use the following elements that they identified as being critical for success (note that these elements are also directly extracted from the report):

- expanding and enhancing the roles of quality councils and similar bodies to support the development of improvement skills and to facilitate system-wide efforts to improve the quality and efficiency of care;
- creating greater local capacity for improvement through training and leadership development;

Evidence >> Insight >> Action

- placing greater emphasis on physician leadership training to enhance organizational capability, not just individual capability;
- identifying priority areas for improvement with specific targets and timelines to help align system-wide efforts;
- continuing to focus on the development of electronic clinical information systems, but enhancing supports for collecting and using data on current performance even if such data require manual collection; and
- expanding current projects to improve patient engagement in the design and improvement of care delivery in order to promote patient-centred care and to engage and align clinicians.(9)

Evidence about levers to help organizations accelerate quality advancement

The Canadian Foundation for Healthcare Improvement (CFHI) identifies six levers for advancing quality, which we briefly describe in Table 1, followed by a description of the key findings from systematic reviews that we identified about them.

Table 1: Descriptions and examples of levers for advancing quality (content derived from a summary provided by CFHI)(18)

Levers for advancing quality	Description
Focus on population needs	- This requires developing an understanding of the needs of the population served and using monitoring and evaluation based on population-level performance targets to measure progress. - This could involve using the Triple Aim outcomes that focus on improving patient experience, improving population health and reducing the per capita cost of care to measure progress at the population level.
Engaging front-line managers and providers in creating an improvement culture	- This involves fostering collaboration with and leadership from healthcare providers and front-line managers working in the system for supporting initiatives to advance quality.
Building organizational and system capacity	- Ensuring an organization has the capacity and self-reliance to advance quality requires providing training in quality improvement, including having the ability to identify priorities for improvement and to collaborate to take action to implement needed changes.
Creating supportive policies and incentives	- This requires organizational policies that support a healthy workplace, as well as opportunities for staff to acquire and use skills to support quality improvement.
Engaging patients and citizens	- Patients and families can be engaged (e.g., through regular meetings as part of an organizational committee) to provide valuable insight about their values and preferences for designing, implementing and evaluating approaches to advancing quality.
Promoting evidence-informed decision-making	- This involves supporting healthcare providers, managers and policymakers to find and use relevant and high-quality research evidence to inform efforts to advance quality.

We identified systematic reviews related to all of the six levers, which we outline below.

Focus on population needs

Developing an understanding of the needs of populations, and targets for addressing those needs, could draw on priority-setting processes. As detailed in two recent evidence briefs (one about addressing overuse of health services in Canada and another about advancing national childhood cancer-care strategies in Latin America), the four systematic reviews identified from Health Systems Evidence related to priority setting are

all older and of medium (19;20) or low quality.(21;22) While none provided an explicit assessment of the benefits, harms, and costs of priority setting, they did provide information related to key elements of such processes. In general, the reviews point to the importance of using a mix of quantitative techniques (e.g., to solicit general feedback and guidance) and qualitative techniques (e.g., where decisions are needed) for priority setting with different groups of stakeholders (e.g., policymakers, funders, patients and families/caregivers). One of the medium-quality reviews highlighted that either formal priority-setting processes (e.g., assembling a government-appointed committee with specific principles or factors to be considered during the process) or informal priority-setting processes (e.g., informal debates, discussions or consensus-building meetings) can be used.(21) The same review emphasized the importance of identifying principles and factors to be considered during priority-setting processes (e.g., efficacy, effectiveness, equality and solidarity).

The other reviews found that these types of processes have been operationalized using a range of quantitative, qualitative and mixed techniques designed to elicit preferences from stakeholders.(19-22) For example, reviews of priority setting in developing countries (22) and for health technology assessments (20) indicate that several processes have used interdisciplinary panels or committees of funders, health professionals and researchers to provide advice. In addition, one of the reviews focused on public engagement in priority setting for resource allocation and found that engaging the public is most common during visioning and goal setting.(19)

Engaging front-line managers and providers (or other stakeholders)

We identified five systematic reviews focused on engaging stakeholders (e.g., clinicians and/or relevant stakeholder organizations) in: 1) research;(23) 2) program evaluation;(24) and 3) quality-improvement initiatives.(25-27) As described in recent evidence briefs,(1;2) one recent, medium-quality review focused on the benefits and challenges of engaging stakeholders in a process of developing and conducting systematic reviews.(23) Stakeholder engagement was found to be most beneficial for identifying and prioritizing topics for research, and providing pragmatic feedback on the research protocol. Other key benefits include ensuring that findings are interpreted with the end user in mind, developing final products that are readable and accessible, and facilitating wider dissemination and uptake of the research findings. A second review focused on stakeholder engagement in program evaluation and found limited research evidence, but did find considerable overlap in the key features of stakeholder-engagement processes in the literature.(24) Specifically, the review indicated that the methodological centrepiece of these processes is entering into collaboration with a collective willingness to participate, and placing emphasis on the need to draw on the strengths of each member while respecting their unique positions and expertise.(24)

Lastly, three reviews focused on collaboration as part of quality-improvement initiatives. A recent medium-quality review assessed the components of quality-improvement collaboratives and indicated that because of imprecise reporting about specific components of collaboratives, it was impossible to derive the needed active ingredients for them to improve care.(26) However, the review indicated that its findings were consistent with an earlier review that concluded that quality-improvement collaboratives can support change at the provider level for process outcomes such as medication management, patient education and tracking of preventive actions. Moreover, the review indicated that most commonly reported components of quality-improvement collaboratives included providing in-person learning sessions, using plan-do-study-act cycles, implementing a multidisciplinary quality-improvement team, and conducting new data collection as part of the quality-improvement process. Another medium-quality but older review found that multifaceted collaborative-care interventions were effective for improving appropriate care outcomes in surgery.(25) Moreover, the review found that regional collaborations resulted in a number of positive health outcomes (e.g. decreased mortality rates, reduced duration of post-operative intubations and fewer surgical site infections), as well as quality improvements. The review also found that there were a number of critical factors associated with the success of communities of practice, including: 1) trust among health professionals and institutions; 2) the availability of good-quality data; 3) commitment among participating institutions; and 4) adequate infrastructure and methodological support for quality management. This review also suggested that strong clinical leadership contributed to ensuring successful communities of practice. The last review, which was older and of low quality, found limited information on the impact of clinical governance (i.e., a systematic and integrated

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approach to ensuring that service providers are accountable for delivering quality healthcare), chronic-disease management, care of the elderly, and mental healthcare.(27)

As outlined in the same evidence briefs, deliberative processes could also be used as part of a stakeholder-engagement strategy. A recent systematic review described key features and intended effects of deliberative dialogues.(28) Specifically, dialogues could be periodically convened to systematically elicit tacit knowledge, views and experiences of stakeholders about advancing quality. The model developed in the review outlines three key features of deliberative dialogues, which include ensuring an:

1) appropriate meeting environment (e.g., by ensuring adequate resources, commitment from participants, transparency, timeliness of the issue, appropriate group size, clear meeting rules, pre- and post-meeting tasks, and effective facilitation);
2) appropriate mix of participants (e.g., by ensuring fair and balanced representation of those with an interest in the issue, and that participants are motivated and provided with the resources they need to meaningfully engage in the issue); and
3) appropriate use of research evidence (e.g., fostering a clear understanding of the policy issue among all participants by presenting what is currently known about it based on the best available research evidence).

The model further outlines several intended effects of deliberative dialogues, including short-term (e.g., strengthened capacity of participants to address the policy issue), medium-term (e.g., strengthened community or organizational capacity) and long-term effects (e.g., strengthened system capacity to make evidence-informed decisions).(28) In addition, a recent evaluation of deliberative dialogues in six African countries found that they were viewed positively and led to strong intentions to act on what was learned, regardless of the country, health system issue addressed or the group actors investigated.(29)

Building organizational capacity and creating supportive policies and incentives

The next two levers of building organizational capacity and creating supportive policies and incentives could draw on findings related to management strategies that have been used or proposed to be used as part of efforts to advance quality in health systems. From our searches for reviews about management strategies, we identified one older medium-quality review (30), one recent low-quality review (31) and one older low-quality review (32) focused on evaluating various management strategies that have been borrowed from other industries (e.g., the Lean model) and used to support change in organizations and health systems. The older medium-quality review evaluated the effectiveness of quality-improvement initiatives borrowed from the manufacturing industry in the field of surgical healthcare, and found that initiatives such as Lean and Six Sigma could improve various dimensions of surgical care.(30) The recent low-quality review focused on the Lean management model, and the results suggested that while there were benefits, it was still unclear what the specific benefits were, and which challenges were likely to arise when implementing Lean in healthcare settings.(31) The older low-quality review evaluated a number of management strategies – including Six Sigma, Lean, and Studer's Hardwiring for Excellence – and concluded that these approaches were successful for improving healthcare processes and outcomes across a wide range of settings.(32)

Another older low-quality review was identified, and found that there are at least five major factors associated with successful large-scale system transformation:

1) top-down engaged leadership that is passionately committed to change, as well as distributed and capable leadership that is effective at engaging personnel at all levels of the system in change;
2) a commitment to measurement across the complement of intended and unintended consequences and reporting on progress toward short- and long-term goals;
3) awareness and consideration of historical context and resource constraints to help avoid unnecessary pitfalls while ensuring buy-in and support of necessary stakeholders;
4) significant physician engagement; and
5) engagement of patients and families if one of the goals is patient-centredness.(33)

Engaging patients and citizens

We identified eight systematic reviews that focused on public- and consumer-engagement processes,(34-41) which were included in recent evidence briefs.(1;2) Of the eight systematic reviews about public and consumer engagement, all indicated that the available evidence is limited and that it is difficult to draw firm conclusions about the benefits of particular public- and consumer-engagement processes.(34-41) An older, medium-quality review found that those who participate in well-designed interactive public-engagement processes report high levels of satisfaction across different components of the process, as well as increased levels of topic-specific learning.(34) Another older, medium-quality review also found that case studies of project administrators' views about the impact of patient engagement indicate that it has contributed to changes in services.(37) Also, findings from a recent medium-quality review that evaluated community engagement as a mechanism for improving the health of disadvantaged populations suggested that community engagement models can improve health and health behaviours in disadvantaged populations.(42) The review also found the key components of community engagement that had an impact on improving health outcomes include real power sharing, collaborative partnerships, bidirectional learning, incorporating the voice and agency of beneficiary communities, and using bicultural health workers as part of delivery of interventions.(42)

The reviews also noted that:
- the underlying goal of public deliberations is to obtain public opinion (including from under-represented individuals and groups) to provide insight into social values and ethical principles for consideration in public decisions;(35)
- when adapting public-deliberation processes (e.g., citizen juries) for specific aims, special attention should be paid to recruitment, independent oversight by a steering committee, duration of the jury, moderation, and respect for volunteer participants;(40)
- common tasks in public deliberation include developing policy directions, recommendations and tools, and priority setting for resource allocation;(35;40)
- strategies that can be used for public and consumer engagement vary in their goals, scope of activities and methods used,(39) and processes need to be adapted to the context of the policy issue;(34)
- public and consumer engagement can be helpful for improving dissemination of information and processes for developing interventions, as well as for enhancing awareness and understanding among citizens;(36;41)
- training of patients and their families, as well as healthcare professionals, is an important component of successfully involving cancer patients and their families in research, policy, planning and practice;(38) and
- involving patients in the planning and development of healthcare plans has several benefits for consumers (e.g., improved self-esteem), providers and staff (e.g., rewarding experience), processes of care (e.g., simplified appointment procedures) and broader supports (e.g., improved transportation between sites and access for people with disabilities).(37)

Promoting evidence-informed decision-making

Supporting an evidence-informed approach to advancing quality at the clinical level requires identifying behaviours that need to be changed and then using strategies and techniques to support the needed changes. Identifying what needs to change could be accomplished by using a systematic/structured approach and/or by using iterative/theory-based approaches to identify the underlying causes of problems. Drawing on three recent evidence briefs,(2-4) we summarize possible systematic and iterative/theory-based approaches in Appendix 3. The same evidence briefs also identify many strategies and techniques for supporting behaviour change, and methods for delivering them to optimize clinical practice (i.e., provider-targeted implementation strategies). Many such approaches have been evaluated, and as of October 2016 there were more than 1,100 systematic reviews evaluating provider-targeted implementation strategies in Health Systems Evidence (www.healthsystemsevidence.org). While assessing these reviews is beyond the scope of this synthesis, a recent (non-systematic) review provides a summary of the results of the highest quality and most up-to-date systematic reviews produced by the Cochrane Effective Practice and Organizational Change (EPOC) group.(43)

This set of EPOC systematic reviews found beneficial effects of: optimizing clinical practice for educational materials;(44) educational meetings;(45) educational outreach visits;(46) local opinion leaders who can champion change;(47) audit and feedback;(48) computerized reminders;(49) and tailored interventions.(50) While each of these interventions has been found to have positive absolute effects ranging from 2-12%, an older medium-quality systematic review found that combining them in multifaceted interventions does not result in increased effects on optimizing practice.(51) In addition, financial incentives/disincentives can also be used to change the behaviour of providers. Key findings from an evidence brief about using financial incentives to achieve health-system goals indicate that:

- financial incentives targeting citizens can be effective at changing behaviours, but the evidence supporting these effects is either inconsistent (e.g., for improving adherence to medicines),(52) indicates that effects are not sustained in the long term (e.g., for promoting healthy behaviours such as changes in smoking, eating, alcohol consumption, and physical activity),(53-55) or require substantial cash incentives to sustain behaviour changes (e.g., for smoking cessation);(56)
- the reviews of the evidence for the use of financial incentives for health professionals,(57-61) health organizations (62) and for both health professionals and health organizations,(63-65) found that evidence is either insufficient,(59;61;64;65) modest and of variable effects,(58;60) or based on perceived outcomes (e.g., organizational leaders),(62) and/or point to incentives being more effective for changing some behaviours in the short run (e.g., for simple, distinct and well-defined behaviours such as providing priority services to specific populations)(58;64) or for specific types of conditions (e.g., for chronic rather than acute care),(63) but not for other more complex behaviours (e.g., improving adherence to clinical guidelines)(58) or over the long term (e.g., retention of human resources);(57) and
- how they are designed (e.g., using cash incentives for citizens, selecting targets based on those with the largest room for improvement, and using process and intermediary outcome indicators as target measures) (52;66) and complemented by other policy instruments (e.g., using cash plus other motivational interventions for citizens, combining with educational interventions and audit and feedback for health professionals)(53;67) can be very important.

A notable finding from across the reviews focused on strategies and techniques for optimizing clinical practice is that while the absolute effect sizes are similar, there are large distributions of observed effects. Given this, Grimshaw et al. suggest that the likely effects of interventions vary in relation to the degree to which the causal mechanisms of action for the intervention address the specific barriers identified.(43) This interpretation makes it even more essential to engage in the types of activities outlined in Table 2 for diagnosing the underlying cause of the problem, and then selecting from the array of candidate strategies and iteratively refining and tailoring them to ensure the active ingredients, causal mechanisms, mode of delivery and intended targets are combined in a way that maximizes the impact. This interpretation is further supported by the Behaviour Change Wheel, which indicates that "[a] given intervention might change one or more components in the behaviour system. The causal links within the system can work to reduce or amplify the effect of particular interventions by leading to changes elsewhere."(68) Furthermore, efforts to tailor interventions need to draw on the broader categories of interventions outlined in Appendix 4, but for those working at the programmatic level (as opposed to those making decisions about the overall direction), it will be important to draw on a more detailed taxonomy of 93 behaviour-change techniques.(69)

Supporting evidence-informed decision-making among managers and policymakers requires a different set of approaches than those used for clinicians, given the different types of decisions made and the wide array of considerations that need to be addressed as part of making policy-related decisions. An older review of 124 studies found two factors that emerged with consistency that improve the use of research evidence by policymakers: the timing and timeliness of research evidence (i.e. having evidence available within the timelines that policymakers work); and interactions between researchers and policymakers.(70) Approaches to ensuring timely access to research could include providing rapid-response programs (i.e. conducting syntheses, such as this one, in timelines of days or weeks as opposed to months or years) and maintaining one-stop shops for research evidence (e.g., Health Systems Evidence for questions about health systems, HealthEvidence for questions about public health and EvidenceUpdates for clinical questions). Approaches to supporting interactions could include convening stakeholder dialogues with policymakers, stakeholders and

researchers that are informed by an evidence brief (i.e., a synthesis of evidence about a problem, options to address the problem and implementation considerations) to address an issue related to advancing quality in healthcare.

Overview of structures and processes of Canadian and select international agencies focused on advancing quality in health systems

Overview of Canadian agencies

In Table 2 we outline the mandate, strategic priorities and governance structure for quality agencies that we identified in each province, and Table 3 outlines the supports available and accountability for advancing quality in the provincial agencies (based on what we were able to identify from their websites and other publicly available documents). For the latter, the only example of an approach to assessing the accountability of the quality agency was in Ontario (Health Quality Ontario). Moreover, several provincial agencies (Alberta, Ontario, New Brunswick, Nova Scotia and Newfoundland and Labrador) engage in activities that would be associated with both quality improvement (e.g., education) and quality assurance (e.g., publicly reporting on priorities in the system such as wait times). Within these groups, Alberta and Ontario appear to have agencies that engage in the most comprehensive range of activities of all the provinces that we scanned. We provide a summary of other key points from the tables below.

The mandates of most of the agencies are stated in broad terms with most related to advising their respective ministries of health about matters related to improving quality, using capacity building and education to support quality improvement, supporting providers, organizations and/or regions to implement evidence-based approaches to optimize care, and ensuring transparency and accountability in their health systems (e.g., through monitoring, evaluation and reporting on performance). Some unique components of agency mandates include:

- Alberta having a mandate to appoint a panel and provide administrative support for public inquiries relating to the health system;
- Saskatchewan including a mandate specific to optimizing prescribing practices and to identify human resource issues in the province;
- Saskatchewan and Ontario including health technology assessment within the mandate of their respective quality agencies;
- Ontario and New Brunswick being the only provinces to have an explicit mandate to engage with citizens/patients to give them a voice in shaping a quality health system (although Alberta and Nova Scotia have this as part of their strategic priorities and others include it in their organizational activities); and
- Quebec having a focus on population and public health, collaborating with universities to design and update curriculum, and cooperating with other Canadian and international agencies to exchange best practices (note that we included the Institut national de santé publique du Québec given that what would have been considered to be the system-wide quality agency in Quebec – the Quebec Health Welfare Commissioner – had its funding eliminated in the most recent provincial budget).

Only five provinces (British Columbia, Alberta, Saskatchewan, Ontario and Nova Scotia) identify strategic priorities in addition to their overall mandate. These include priorities that are focused on:

- very broad priorities (e.g., such as those for British Columbia, Alberta and Nova Scotia which include priorities that are very similar to their mandate);
- approaches that can be used to achieve their mandate (e.g., the strategic priorities in Alberta and Nova Scotia to partner/engage with the public and/or patients);
- outcomes (e.g., Ontario, which has its mandate tightly linked to the *Excellent Care for All Act, 2010,* and uses the Triple Aim outcomes in its priorities); and

- specific system-level priorities (e.g., Ontario also having a focus on building supportive and quality workplaces that support patient- and family-centred care and collaborative practices, and developing a highly skilled workforce that includes a mix of providers);

The last column of Table 2 outlines the key elements of the governance structure for each agency. All of the boards of directors are accountable to their respective ministries of health. However, the Health PEI Quality and Safety Council is a sub-division of a government agency and comprised of 18 teams that carry out its mandate. Note that we could not identify the governance structure for the Quality and Patient Safety Advisory Committee in Newfoundland and Labrador.

As outlined in Table 3, each agency uses a mix of health-system arrangements (i.e., governance, financial and delivery arrangements) and programs (e.g., educational programs) to advance quality. For health-system arrangements, activities are focused on governance and delivery arrangements with no agencies directly using financial arrangements to advance quality. For governance arrangements, many provide some form of consumer- (e.g., the Patient Voices Network in B.C. and the Patient, Family and Public Advisors Network and Council from Health Quality Ontario) and/or stakeholder-engagement (e.g., convening quality forums with health-system stakeholders to identify and share best practices) processes as part of their activities. For delivery arrangements, most agencies provide some form of quality- and safety-monitoring system that collects and reports on a range of indicators. Other delivery arrangements used by some agencies include supports for safe workplace conditions and patient safety (e.g., hygiene and infection control in Nova Scotia and PEI), and developing packages of care (e.g., medication management checklists for supportive living in Alberta and the development of mental health standards through Health Quality Ontario for adults in hospitals and long-term care homes). At the programmatic level, the main approaches used include a variety of educational supports with many also providing supports for adopting evidence-based approaches, evaluating key priorities (e.g., patient satisfaction) and fostering collaboration within the system.

Lastly, we found only one example of an approach (from Health Quality Ontario) to evaluating the performance of agencies themselves as a form of accountability for their mandates to advance quality (however, there may be other evaluations available, but not readily accessible from the sources we scanned for this review). In terms of evaluation of Health Quality Ontario, it has implemented a scorecard to measure organizational progress on their key performance indicators related to finance, human resources, delivery and risk. This includes annual baseline reporting combined with quarterly monitoring systems.

Overview of international agencies

Internationally, a number of countries have taken concerted efforts at the national level to advance quality in their health systems by establishing largely independent agencies to monitor, evaluate and, in some cases, deliver programs aimed at improving the quality of health services. The mandates for the international agencies that are summarized in Table 4 are similar to Canadian agencies in their focus on research, monitoring and evaluation. However, there are several notable differences in the mandates of the international and Canadian agencies, including that many international agencies deliver quality-improvement programs along with the development of and/or enforcement of accreditation standards for healthcare providers and organizations. Another difference between international and Canadian examples is the clear relationship between the quality-assurance body and the government that is described in many of the international mandates. In the examples from New Zealand, Sweden and Germany the mandate of the organization includes not only publishing information, but a requirement to produce recommendations to the government for the closing of projects or programs.

As outlined in Table 4, the international agencies have a wide array of strategic priorities. The priorities range from specific areas or projects, such as Healthcare Improvement Scotland (e.g., empowering people to have an informed voice in managing their own care) or the Australian Commission on Safety and Quality in Healthcare (e.g., reducing antimicrobial resistance or exposure to radiation in childhood from CT scans), to those who prioritize work under a broader theme such as improving equity (New Zealand Health & Safety

Commission) or living longer lives (National Health Service Quality Improvement). Those with broader themes tended to prioritize them over longer periods of time (e.g. three-to-five years), which was more closely aligned with Canadian examples than those that specified projects or programs.

Governance structures are largely similar across international examples, with most being governed by a board of six to14 members. In many cases these boards are accountable to ministries of health or government committees. Two exceptions for these arrangements are Advancing Quality Alliance (United Kingdom) which is commissioned under contract to report and ensure progress on a five-year national plan, and the Institute for Healthcare Improvement (United States), which is an entirely independent body from the government that raises the majority of its finances from fee-based programs. With the exception of these two organizations, most other agencies have a legislative base for their development.

In Table 5, many of the international agencies use a wider range of health-system arrangements to advance quality than the Canadian agencies. This includes many of the international agencies providing funding or financing for the development, delivery and/or evaluation of services that can be used to achieve their strategic goals, while others use governance arrangements such as registering or accrediting healthcare providers and institutions. These agencies also deliver a wider range of programs, with many moving away from public reporting and evaluation towards more proactive approaches to quality improvement (e.g., the Australian Commission on Safety and Quality in Health Care conducting real-time monitoring of healthcare-associated infections, and enforcing of standards for priority areas such as hand hygiene and surgical safety).

Finally, similar to Canadian agencies, we identified few examples of evaluations used as part of ensuring accountability of efforts to advance quality (Table 5). Many of the agencies used annual reports and progress reports to account for their performance, while others had been subjected to ad hoc audits or evaluations by consulting agencies. When these agency-wide evaluations were completed they were often commissioned by national audit offices or offices of public management. Some agencies such as the Agency for Healthcare Research and Quality and the Australian Commission on Safety and Quality in Healthcare rely on more frequent program or project evaluations to account for their performance rather than larger assessments or audits of the entire agency.

Table 2: Summary of mandates and governance structure of provincial quality councils

Province and council name	Mandate	Strategic Priorities	Governance structure
B.C. Patient Safety and Quality Council (BCPSQC), British Columbia (71-74)	1) Bring a provincial perspective to patient safety and quality improvement 2) Facilitate the building of capability and expertise for patient safety and quality improvement 3) Support health authorities and other service-delivery partners to improve quality 4) Improve health-system transparency and accountability to patients and the public	The following are BCPSQC's aims from 2012-2015: 1) fostering a province wide perspective 2) advancing capability and capacity for improvement 3) accelerating improvement 4) improving transparency 5) fostering a quality culture 6) creating value	• The Council consists of nine members: the chair, six members and two ex-officio members (a representative for the Minister of Health, and the UBC Academic Chair for Patient Safety) • The chair of the Council is accountable to the Minister of Health Services through the deputy minister
Health Quality Council of Alberta (HQCA), Alberta (75-79)	1) Measure, monitor and assess patient safety and health service quality 2) Identify effective practices and make recommendations for the improvement of patient safety and health service quality 3) Assist in the implementation and evaluation of activities, strategies and mechanisms designed to improve patient safety and health-service quality 4) Survey Albertans on their experience and satisfaction with patient safety and health-service quality 5) Assess or study matters respecting patient safety and health-service quality 6) Appoint a panel and provide administrative support for public inquiries relating to the health system, as directed by the Lieutenant Governor in Council	The following are HQCA's aims from 2015-2018: 1) build capacity – Enable high quality and safe patient care by assisting stakeholders at multiple levels to develop skills in system improvement 2) measure to improve – Measure, analyze and report on healthcare delivery to drive actionable improvement that enhances the quality of healthcare for Albertans 3) monitor the health system – Monitor and report on health-system level indicators to characterize health-system performance over time and enable comparison where appropriate 4) partner with the public – to support and enable effective citizen participation in their healthcare and the healthcare system	• The board of directors consists of no more than 10 members, including a chair, appointed by the Lieutenant Governor in Council • The board appoints a chief executive officer, who is accountable to the board
Health Quality Council of Saskatchewan	1) Monitor existing clinical standards of healthcare and to research and develop new clinical standards of healthcare	The following are HQCoS's aims from 2015-2016: 1) improve population health	• The board of directors consists of not more than 12 members,

Province and council name	Mandate	Strategic Priorities	Governance structure
(HQCoS), Saskatchewan (80-84)	2) Research and evaluate prescription drug prescribing practices, prescription drug utilization and existing processes for reviewing and approving prescription drugs 3) Assess the effectiveness of new and existing health technologies 4) Promote improvement in the quality of healthcare through training and education 5) Develop and implement training and education programs and activities to promote improvement in the quality of healthcare 6) Promote research and education leading to improvement in the quality of healthcare 7) Monitor and assess the quality of the health services available in Saskatchewan 8) Investigate, inquire into or study matters respecting health services and the quality of healthcare that are referred to it by the minister 9) Undertake research with respect to any of the objects described in clauses 10) Make recommendations to the minister and others 11) Research and identify human resource issues associated with any of the listed objectives	2) improve the individual's experience, achieve timely access and continuously improve healthcare safety 3) achieve best value for money, improve transparency and accountability, and strategically invest in facilities, equipment and information infrastructure 4) build safe, supportive and quality workplaces that support patient and family-centred care and collaborative practices, and develop a highly skilled, professional and diverse workforce that has a sufficient number and mix of service providers	including a chair, appointed by the Lieutenant Governor in Council • The council is led by the board of directors, who are accountable to the Minister of Health
Manitoba Institute for Patient Safety (MIPS), Manitoba (85-88)	1) Develops, shares and promotes patient safety resources 2) Hosts and sponsors patient safety education 3) Advises on patient safety and related policy legislation	No specific priorities listed	• The board of directions consists of 12 members, with five appointed by the Minister of Health and the remaining seven elected by the members of the MIPS • The activities of the MIPS are directed by the board

Province and council name	Mandate	Strategic Priorities	Governance structure
	4) Raises awareness about patient safety issues and the Manitoba Institute for Patient Safety		• The MIPS is a registered charity and receives funding from the provincial government
Health Quality Ontario (HQO), Ontario (89-97)	1) Monitor and report on how the health system is performing 2) Provide guidance on important quality issues 3) Assess evidence to determine what constitutes optimal care 4) Engage with patients and give them a voice in shaping a quality health system 5) Promote continuous quality improvement aimed at substantial and sustainable positive change in healthcare	The following are HQO's aims from 2016-2019: 1) provide system-level leadership for healthcare quality 2) increase availability of information to enable better decisions 3) evaluate promising innovations and practices, and support broad uptake of those that provide good value for money 4) engage patients in improving care 5) enhance quality when patients transition between different types or setting of care	• The chief executive officer is accountable to, and works under the direction of the Agency Board • The board chair, on behalf of the board is accountable to the Minister of Health and Long-Term Care
Institut national de santé publique du Québec (INSPQ), Quebec (98-100)	1) Contributing to the development, consolidation, dissemination and application of knowledge in the field of public health 2) Informing the minister of the impact of public policies on the health and well-being of the population of Québec 3) Informing the population of the state of public health and well-being, and of emerging problems, their causes, and the most effective means of preventing or resolving them 4) Collaborating with universities in designing and updating undergraduate, graduate and postgraduate programs in the field of public health	No specific priorities listed	• The board of governors is composed of a chief executive officer and 14 other members • All members on the board of governors are accountable to the Minister of Health and Social Services

Province and council name	Mandate	Strategic Priorities	Governance structure
	5) Collaboration with the various research organizations and funding bodies, developing and promoting research in the field of public health 6) Establishing channels of communication with various organizations, both within Canada and at the international level, to promote cooperation and the exchange of information 7) Carrying out any other expert task in the field of public health that is entrusted to it by the minister		
New Brunswick Health Council, New Brunswick (101-103)	1) Engaging citizens in a meaningful dialogue 2) Measuring, monitoring and evaluating population health and health-service quality 3) Informing citizens on health system's performance 4) Recommending improvements to the Minister of Health	No specific priorities listed	• The chief executive officer is subject to the direction of the council • The council in turn is accountable to the Minister of Health
Quality and Patient Safety Advisory Committee (QPSAC), Nova Scotia (104-107)	While Nova Scotia does not have a dedicated quality agency, the committee's mandate is to provide advice and make recommendations to the Minister of Health and Wellness on matters related to quality and patient safety across the continuum of Nova Scotia's healthcare system	The following are QPSAC's aims from 2011-2016: 1) bring a patient perspective to patient safety and quality improvement 2) facilitate the building of capacity and expertise in quality and patient safety through educating leadership 3) demonstrate transparency and accountability to patients and the public 4) prioritize areas of quality and patient safety for improvement	• The committee is comprised of a maximum of 10 committee members, including a chair • The chair is appointed by the Minister of Health and Wellness and is accountable to the minster through the deputy minister
Health PEI Quality and Safety Council, PEI (108;109)	While Prince Edward Island does not have a dedicated quality agency, the committee has the mandate of:	No specific priorities listed	• The Health PEI Quality and Safety Council is a subdivision of the Health PEI Board of Directors

Province and council name	Mandate	Strategic Priorities	Governance structure
	1) Responsible for identifying, measuring and monitoring areas for quality improvement 2) Embedding quality-improvement practise in the organization		• The Health PEI Quality and Safety Council is comprised of 18 quality teams which carry out its mandate
The Quality and Evidence-based Practice Sub-Committee, PEI (109)	While Prince Edward Island does not have a dedicated quality agency, the committee has the mandate to enhance quality improvement activities specific to physician clinical practice	No specific priorities listed	• The Quality and Evidence-Based Sub-Committee is a subdivision of the Provincial Medical Advisory Committee
Quality and Patient Safety Advisory Committee, Newfoundland and Labrador (110)	Unable to identify the mandate based on publicly available information	Unable to identify strategic priorities based on publicly available information	Unable to identify the governance structure based on publicly available information

Table 3: Summary of supports and accountability for QI used by provincial quality councils

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

B.C. Patient Safety and Quality Council, British Columbia (71-74)	• Governance arrangements
	  o Accountability
	    ▪ Advising the Minister of Health on patient safety and quality of care issues
	  o Consumer and stakeholder involvement
	    ▪ Administer the Patient Voices Network originally created by the B.C. Ministry of Health to engage B.C. patients, families, caregivers and friends in the dialogue of quality improvement in the healthcare system
	    ▪ Organizes a Quality Forum
	    ▪ Connecting Leaders with Knowledge project
	    ▪ B.C. Health Quality Network for healthcare stakeholders to share ideas, distribute resources, and support one another in areas of patient safety and quality improvement
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o None identified
		• Offer a six-month professional development program called Quality Academy where supports are provided to help participants (physician and clinical leaders, quality and operational leaders, and boards and senior executives) effectively lead quality and safety initiatives, including teaching and advising others in the process of improving healthcare quality
		• Support for initiatives that encourage collaboration and coordination from health-system stakeholders throughout the province
		• Conduct external reviews of critical incidents and issues as requested by the Minister of Health and/or health authorities to improve transparency
			None identified	None identified

Health Quality Council of Alberta (HQCA), Alberta (75-79)	• Governance arrangements
	  o Consumer and stakeholder involvement
	    ▪ Health Quality Network for sharing best practices in quality improvement across the province
	    ▪ Tools (e.g., ReLate/ReSPOND Tool Kit) to deal with patient complaints and concerns
	• Financial arrangements
	  o None identified
	• Delivery arrangements
		General programs
		• Using data gathered and analyzed through quality monitoring and improvement systems to collaborate with Alberta Health, Alberta Health Services, health professions, academia and other stakeholders to translate knowledge into practical improvements to health-service quality and patient safety in the healthcare system
		• Alberta Quality Matrix for Health to enable the public, patients, providers and
			None identified	None identified

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	o Packages of care
	  ▪ Medication management checklist for supportive living
	o Supports for safe workplace conditions and patient safety
	  ▪ Disclosure Framework, Managing Disruptive Behaviour in Healthcare Workplace-Provincial Framework, Patient Complaints Framework, Patient Safety Framework, Simulation Based Mock-Up Evaluation Framework
	o Quality and safety monitoring and improvement systems (including the provision of information to Global Patient Safety Alerts)
		organizations to see how levels of quality and areas of need intersect (this has been used for policy development, strategic and service planning, and to educate the public about quality in healthcare)
		
		Programs for healthcare providers
		• Patient Experiences Awards, which recognizes healthcare workers in Alberta who promote positive patient, client or resident experiences
		• Patient Safety Review Handbook to help healthcare providers, administrators and regulators conduct retrospective reviews of healthcare
		• Supporting adoption of tools and frameworks through educational initiatives and training for providers
		• Offering courses and certifications in quality-management and safety education
		
		Auditing/evaluating Alberta's health system
		• Reviewing and reporting on priority areas (e.g., continuity of care, delivery of laboratory services and primary care)
		• Conducting an independent inquiry to investigate receipt of preferential access to publicly funded health services in Alberta
		
		Measuring and reporting patient experience
		• Measuring patient-reported outcome measures of health-related quality of life
		• Conducting and reporting on several patient experience surveys (Commonwealth Fund Surveys, Emergency Department Survey, Home Care Clients' Experience		

Evidence >> Insight >> Action

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
		Survey, Long Term Care Family Experience Survey, Overweight and Obesity in Adult Albertans, Satisfaction and Experience with Health Services Survey, Supportive Living Family & Resident Experience Survey, and more) • Surveying physicians and reporting on the Role and Process of Physician Advocacy Survey		

Health Quality Council of Saskatchewan (SHQC), Saskatchewan (80)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Safety Alert/Stop the line, Reporting on Improvement in Health Care, Computer Simulation Modelling of Health System Dynamics, ALC data collection, Emergency Department Waits and Patient Flow Initiative
		SHQC supports the implementation of strategies set by the Ministry of Health through programs that:
		• assess how priority areas align with provincial targets (e.g., progress towards achieving a 60% reduction in ER wait times by March 2019)
		• develop and maintain key indicators such as hospitalization rates for chronic-disease management, and patient connectedness to a family physician
		• support measurement activities across the province (i.e., ensuring the right things are being measured properly)
		• measure health-system performance through the Quality Insight program to make health-system information more accessible to all stakeholders, and to report on the impact of improvement activity across the province
		• coordinate and support the training of health-system leaders, managers and providers in continuous improvement tools and methodologies through various programs (see programs under supports for staff training in the adjacent column) such as: Clinical Quality Improvement Program,
			None identified	None identified

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Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
		Lean Improvement Leader's Training, Learning Series, Kaizen Network, Appropriateness of Care Network • measure patient experience using the acute care unit-level survey and primary healthcare survey • support collaborations with health-system partners and academics in Saskatchewan (University of Saskatchewan, Saskatchewan Centre for Patient-Oriented Research, Saskatchewan Drug Utilization and Outcomes Research Team, Drug Safety and Effectiveness Network/Canadian Network for Observational Drug Effect Studies, Rural Dementia Action Research Team) and beyond (University of Toronto, University of Southampton U.K., King's College U.K.) to improve patient care		

Manitoba Institute for Patient Safety (MIPS), Manitoba (85-88)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o None identified
		• Developing, sharing and promoting patient safety resources for patients, families and healthcare providers such as the Medication Card and the S.A.F.E. (self-advocacy for everyone) toolkit
		• Hosting conferences, sharing guidelines, tips and current research on the topic of quality improvement, medication safety, patient and family involvement, infection control and prevention, falls, and prevention of blood clots
			None identified	None identified

Health Quality Ontario (HQO), Ontario (89-97)	• Governance arrangements
	  o Consumer and stakeholder involvement
	    ▪ Administers Patient, Family and Public Advisors Network and Council
	• Financial arrangements
	  o Funding organizations
		• Support sharing of knowledge for key quality issues and those discovered through the Emergency Department Return Visits Quality Program
		• Provides complimentary patient-engagement tools and resources
		• Provide education and training
			• Implemented a scorecard to measure HQO's organizational progress on key performance indicators (finance,	None identified

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	■ Support organizations to adopt and implement new funding models through information provision such as Clinical Handbooks and site visits to assess readiness as part of the Health System Funding Reform strategy from the Ministry of Health and Long-Term Care
	● Delivery arrangements
	  ○ Packages of care
	    ■ Mental health standards for adults in hospitals and long-term care homes
	  ○ Supports for safe workplace conditions and patient safety
	    ■ Appropriate Prescribing Demonstration Project and Surgical Quality Improvement Network
	  ○ Quality and safety monitoring and improvement systems
	    ■ Data collection and reporting for Health Links which integrate care delivery for patients with complex needs
	    ■ Monitor, analyze and report on health-quality indicators including diabetes complication, timely access to primary care, colorectal cancer, same-day response to phone queries, and patient involvement in decisions
	    ■ Identify best practices, by reviewing evidence of tests and treatments which may be overused
		○ E-QIP: providers are offered quality-improvement and leadership training to improve community mental health care
		  ○ Appropriate Prescribing Demonstration Project, which is an educational program to support best prescribing practice
		● Provide operational oversight of health quality programs such as Adopting Research to Improve Care (ARTIC) Program
		● Assessment of health technologies and medical devices to provide recommendations on whether devices should be publicly funded
			human resources, delivery and risk)
			● Annual baseline reporting and quarterly monitoring systems
			● Audit and Finance Committee makes recommendations regarding finances, human resource plans and policies, and information technology of the organization
			● Management Resources Committee makes recommendations on human resource management, strategy and planning, reviews the CEO's and HQO's performance targets
			● Governance & Nominating Committee develops and reviews by-laws	

Institut national de santé publique du Québec (INSPQ), Quebec (98-100)	● Governance arrangements
	  ○ None identified
	● Financial arrangements
	  ○ None identified
		● The minister may confer the mandate to exercise all or part of the minister's surveillance function or certain surveillance	None identified (the website indicates that it is currently under development)	None identified (the website indicates that it is currently under development)

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
	- Delivery arrangements - Quality and safety monitoring and improvement systems - Santescope, Infocentre de sante publique - Blood-borne infection risk assessment unit	activities, on the conditions and to the extent the minister considers appropriate • The INSPQ's ethics committee reviews all proposed health status surveillance to comment on the purpose of ongoing surveillance or health determinants selected for a surveillance plan, and the type of information it will be necessary to collect, the sources of information to be used and the analytic study envisaged • Sets provincial surveillance direction, conducts surveillance, and reports on provincial surveillance in topics of expertise including Aboriginal health, infectious disease, environmental health and toxicology, individual and community development, lifestyles and prevention of chronic illnesses, occupational health and safety, and injury prevention • Responsible for the leadership and coordination of the Quebec WHO Collaborating Centre for Safety Promotion and Injury Prevention which is comprised of various provincial public health stakeholders • Offers human toxicology expertise (Environmental, clinical and occupational) to the provincial health network of Quebec as well as external clients from around the world through the Centre de toxicology du Quebec (CTQ) • Shares health system surveillance data collected over time across rural and urban Quebec through Santescope, Infocentre de sante publique du Quebec		

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
		• Provides training for patients, families and the public (e.g., the From Tiny Tot to Toddler guide)		
Health Council, New Brunswick (101-103)	• Governance arrangements 　o None identified • Financial arrangements 　o None identified • Delivery arrangements 　o Quality and safety monitoring and improvement systems 　　▪ Monitor and evaluate population health and health services and report findings in the New Brunswick Health System Report Card 　　▪ Monitor indicators based on dimensions of quality: accessibility, appropriateness, effectiveness, efficiency, safety and equity, as well as sector: primary health, supportive/speciality and acute care	• Evaluate patient satisfaction and experience through surveys and stakeholder groups • Monitor indicators based on dimensions of quality: accessibility, appropriateness, effectiveness, efficiency, safety and equity, as well as sector: primary health, supportive/speciality and acute care • Distribute and make information public • Identify best practices	None identified	None identified
Quality and Patient Safety Advisory Committee, Nova Scotia (104-107)	• Governance arrangements 　o None identified • Financial arrangements 　o None identified • Delivery arrangements 　o Supporting safe workplace conditions and patient safety 　　▪ Provides standards and practice guidelines for infection control 　o Quality and safety monitoring and improvement systems 　　▪ Monitor and report on quality indicators including wait times, patient safety and adverse events	• Identify best practices and provide guidance to providers through position papers and research material • Support sharing of knowledge between Atlantic Learning Collaborative, Provincial Quality Directors and Community Health Boards • With healthcare providers, develop and introduce patient safety curriculum	• Performance indicators have been defined for all strategic activities	None identified

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

Health PEI Quality and Safety Council, PEI (108;109)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Supporting safe workplace conditions and patient safety
	    ▪ Hand hygiene policy, electronic medication reconciliation
	  o Quality and safety monitoring and improvement systems
	    ▪ Reports and monitors wait times, number of emergency department visits and appropriate utilization of health care resources
		• Provision of provincial hand hygiene policy and electronic medication reconciliation programs
		• Provision of online patient education resources
		• Implementation of team-based work plans to support quality and access improvements in Mental Health and Addictions
		• Provide Leadership Development Workshops to build management and leadership knowledge and skills
		• Offering rewards and formal acknowledgment to providers and teams who have improved quality and safety in care
		• Implementation of the Lean Six Sigma program which is designed to streamline work flow
			None identified	None identified

Quality and Evidence-Based Practice Sub-Committee, PEI (109;111;112)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Report and monitor wait times, number of emergency department visits and appropriate utilization of healthcare resources
		• Introduction of provincial hand hygiene policy and electronic medication reconciliation programs
		• Provision of online patient-education resources
		• Implementation of team-based work plans to support quality and access improvements in mental health and addictions
		• Provision of leadership development workshops to build management and leadership knowledge and skills
		• Provision of rewards and formal acknowledgment to providers and teams who have improved quality and safety in care
		• Implementation of the Lean Six Sigma program which is designed to streamline work flow
			None identified	None identified

Province and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Other programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

Quality and Patient Safety Advisory Committee, Newfoundland and Labrador (110)	• Governance arrangements
	   o Training and licensure
	     ▪ Implements provincial standards for training and licensing
	 • Financial arrangements
	   o None identified
	 • Delivery arrangements
	   o Information and communication technology
	     ▪ Health Human Resource Information System to manage human resources
	   o Quality and safety monitoring and improvement systems
	     ▪ Reports on patient safety via the electronic Clinical Safety Reporting System
	     ▪ Monitors and reports on wait times, patient satisfaction, drug spending and other health-system indicators
		• None identified	None identified	None identified

Table 4: Summary of mandates and governance structure of international quality councils

Country and council name	Mandate	Strategic priorities	Governance structure
National Health Service Quality Improvement (NHS QI), England (113-117) *transitioned to NHS Sustainable Improvement Team in 2015	• Responsible for driving improvement across the NHS England by building capacity and capability to help develop knowledge and skills across the whole health and care system	• Living longer lives • Enhancing quality of life for people with long-term conditions • Helping people to recover from episodes of ill health or following injury • Ensuring that people have a positive experience of care • Treating and caring for people in a safe environment and protecting them from avoidable harm	• A program board made up of representatives from NHS England, NHS Improving Quality, the Department of Health, NHS Leadership Academy, NHS Trust Development Authority and Salford Royal NHS Foundation Trust meets three times a year and sets the future direction • The NHS QI is regulated by the National Health Service Constitution for England
National Health Services Sustainable Improvement Team, England (113-118)	• Part of broader efforts by the NHS to improve quality, the Sustainable Improvement team is responsible for improving the quality of care by achieving large-scale transformational improvement and change	• Support the delivery of the Five Year Forward View priorities by designing and commissioning improvement programs • Ensure that NHS England has a single improvement method to enable it to continuously improve its own processes and be the most effective commissioner of healthcare services • Support NHS England's regional and area teams to improve and transform local health systems • Ensure Clinical Commissioning Groups and strategic clinical networks meet their improvement requirements • Support the wider NHS system – particularly the NHS Trust Development Authority and academic health science network to make transformational improvement	• National Health Service (NHS) Constitution for England sets outs the mandate of the NHS Sustainable Improvement Team and all other NHS bodies • The National Health Service is overseen by 16 non-executive and executive board members
Advancing Quality Alliance (AQuA), England (119-122)	• Help member organizations to build improvement capability at all levels of their workforce, to develop and implement quality strategies and to address their quality priorities through the resources on offer	• Lead programs to target local quality improvement priorities • Provide meaningful and intelligent insight into quality and safety priorities • Build workforce capability in quality-improvement skills	• Formally accountable to a Board of Governors which meets on a quarterly basis • The board is made up of an executive management team, as well as a number of external appointments from both within the Advancing Quality Alliance's membership and the wider public sector

Evidence >> Insight >> Action

Country and council name	Mandate	Strategic priorities	Governance structure
		• Learn and share with peers through networks and partnership • Access national and international expertise	

Care Quality Commission, England (123-127)	• Responsible for ensuring health and social care services provide people with safe, effective, compassionate, high-quality care, and encourage care services to improve
	• Monitors, inspects and regulates services to make sure they meet fundamental standards of quality and safety, publishing what is found including performance ratings to help people choose care
		• Encourage improvement, innovation and sustainability in care
		• Delivery and intelligence-driven approach to regulation
		• Promote a single shared view of quality
		• Improve our efficiency and effectiveness
			• The Care Quality Commission is an executive non-departmental public body of the Department of Health
			• It is governed by a board of directors made up of five members and an additional three of Chief Inspectors including:
			  o Chief Inspector of Hospitals
			  o Chief Inspector of Social Care
			  o Chief Inspector of General Practice
			• Several subcommittees work with the board and executive team to support their work
			• The chair of the Care Quality Commission is appointed by The Health Committee made up of MPs from the House of Commons.

Agency for Healthcare Research and Quality, United States (128-133)	Responsible for research on:
	• comparative effectiveness
	• quality improvement and safety
	• health information technology
	• preventive and care management
	• healthcare value.
		AHRQ announced the following funding priorities:
		• Innovative methods research to increase the use of systematic reviews
		• Advancing the collection and use of patient-reported outcomes
		• Optimizing care for people living with multiple chronic conditions
		• Innovative research in primary care
		• Improving the quality of care for low income and racial and ethnic minority patients
		• Healthcare delivery system affordability, efficiency and quality
		• Patient-centred outcomes research
			• The AHRQ is funded by the Health and Human Services Office of the Assistant Secretary for Preparedness and Response.
			• AHQR is headed by a director appointed by the Health and Human Services Secretary.
			• AHQR includes four research Centres:
			  o Center for Delivery, Organization and Markets
			  o Center for Evidence and Practice Improvement
			  o Center for Financing, Access and Cost Trends
			  o Center for Quality Improvements and Patient Safety

Institute for Healthcare Improvement, United States (134;135)	• Identification, documentation and spread of best practices in healthcare • Development of frameworks and guides for optimizing performance	• Improvement capability • Person- and family-centred care • Patient safety • Quality, cost and value • Triple aim for populations	• Board of directors made up of 14 members • Work is funded through fee-based program offerings and services as well as through support of foundations, companies and individuals

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Country and council name	Mandate	Strategic priorities	Governance structure
	• Accelerate collective learning and projects to improve the delivery of care in the U.S. and abroad		
Australian Commission on Safety and Quality in Health Care, Australia (136-138)	Leads and coordinates national improvements in safety and quality in healthcare	• Antimicrobial resistance and antimicrobial utilization surveillance project • Australian atlas of healthcare variation • National patient blood management collaborative • Reduction in radiation exposure to children and young people from CT scans • Australian Charter of Healthcare Rights • Collaboration with Independent Hospital Pricing Authority • Australian safety and quality framework for healthcare • Australian safety and quality goals for healthcare	• Commission's governance structure is determined by the National Health Reform Act (2011) and the Public Governance, Performance and Accountability Act (2013) • The commission is jointly funded by the federal, state and territory governments on a cost-sharing basis • The commission is overseen by a board appointed by the Minister for Health • The commission is supported by the Inter-Jurisdictional Committee, which is made up of senior safety and quality managers from the Australian Government Department of Health and the Department of Health from each state and territory
New Zealand Health & Safety Commission, New Zealand (139-142)	• Providing advice to the Minister of Health on how quality and safety in health and disability support services may be improved • Leading and coordinating improvements in safety and quality in healthcare • Identifying key health and safety indicators to inform and monitor improvements in safety and quality • Reporting publicly on safety and quality, including performance against national standards • Sharing knowledge about and advocating for safety and quality	• Identifying areas for quality and safety improvement • Providing advice and commentary – being an intelligent commentator and advocate for change • Assisting the sector to effect change – delivering improvement programs and supporting the sector and consumers as they strive for high quality, safe health care • Improving equity	• The Health & Safety Commission is overseen by a Board made up of seven members appointed under the Crown Entities Act (2004)
Swedish Agency for Health and Care Services, Sweden (143-146)	• Follow up and analyze healthcare, dental care and social services from the perspective of patients and citizens	• A more equitable healthcare system - how can healthcare create more equity in health?	• Led by a board of directors. • Patients' Council is affiliated with the agency that consists of appointed representatives of

Country and council name	Mandate	Strategic priorities	Governance structure
	• Analyzing how health and care services work, as well as reviewing how effective governmental commitments and activities are • Agency must assist the Swedish government with advisory support and recommendations for making the operations and governance of state-run institutions more effective • Agency must evaluate the effects of governmental reforms and initiatives	• Future care options – what are the success factors for sustainable long-term care for the elderly? • Value of coordinated health and social services – how can the needs of coordination best be met? • Patients' views on privacy in eHealth – how should eHealth be designed to meet the privacy needs of patients, users and the public, but allow for proper care, quality and research? • Patient-centred healthcare – what can we learn from research and efforts by other countries to accelerate progress towards more patient-centred care? • Promoting result-oriented social services	patients and users of health and social care services.
The Danish Institute for Quality and Accreditation in Healthcare, Denmark (147)	• Responsible for developing, planning and running the Danish accreditation program for healthcare providers, private hospitals, community pharmacies, community healthcare, primary-care physicians and specialist physicians practising outside of a hospital setting	• None identified	• Independent institution financed partially by public means as well as private funds from private clients to cover accreditation • Institution is governed by a board of directors including representatives from the Danish Health Authority, Danish Regions, The Ministry of the Interior and Health, local governments of Denmark, The Association of Danish Pharmacies, and the Danish Chamber of Commerce
Organization for Transparency and Quality in Health Care, Germany (148;149)	The Organization for Transparency and Quality in Health Care was developed with four main tasks to complete: • engage in quality assurance and continuous quality improvement • develop methods for quality assurance at both inpatient and outpatient care • establish criteria for the evaluation of inpatient and outpatient care • publish the results of its work in a form that is understandable to the general public	• None identified	• Created under the Act on the Development of the Financial Structure and the Quality in the Statutory Health Insurance (2014) • The organization was established by the Board of the Federal Joint Committee • The Federal Joint Committee is responsible for the establishment of the organization as well as decisions on any amendments to the statutes and dissolution of the foundation • The organization is overseen by a 10-member Board of Trustees including two representative of the German Hospital Federation and the

Country and council name	Mandate	Strategic priorities	Governance structure
			accredited Physicians, a representative of the dentists' confederation and five representatives of the Federal Association of Health Insurance

Institute for Quality and Efficiency, Germany (148;150;151;151-154)	• Contribute to improvements in healthcare in Germany by undertaking and publishing assessments addressing the effectiveness, quality and efficiency of health services with an emphasis on:
	  o evaluation of the benefits and harms of drug and non-drug interventions
	  o evaluation of evidence-based guidelines for diseases of the greatest epidemiological importance
	  o provision of easily understandable, public information on the quality and efficiency of healthcare
		• Evaluating the efficacy of drugs as a basis for deciding whether a drug falls under the reference price scheme or not
		• Writing scientific reports and statements on questions of the quality and efficiency of social health insurance benefits
		• Evaluating evidence-based guidelines for epidemiologically important diseases
		• Researching, evaluating and presenting up-to-date medical knowledge of diagnostic and therapeutic interventions of selected diseases
		• Providing comprehensible information to citizens on the quality and efficiency of care
			• Established by the Social Health Insurance Modernization Act (2004)
			• Overseen by a Foundation Council and Board of Directors
			• Members of the board are appointed by the Federal Joint Committee
			• The Board of Trustees and the Scientific Advisory Board act in an advisory capacity to the institute

Regulation and Quality Improvement Authority, Northern Ireland (155;156)	• Responsible for regulating and inspecting the quality and availability of Northern Ireland's health and social care services
	  o Register and inspect independent and statutory health and social care services
	  o Work to assure the quality of services provided by health boards, trusts and agencies
	  o Undertake a range of responsibilities for people with mental ill health and those with a learning disability
		• Improving care – encourage and promote improvements in the safety, quality and availability of health and social care services
		• Informing the population – publicly report on the safety, quality and availability of health and social care
		• Safeguarding rights – protect the rights of all people using health and social care
		• Influence policy – influence policy and standards in health and social care
			• Independent body sponsored by the Department of Health
			• Established by the Health and Personal Social Services Order of 2003
			• Governed by a board of directors comprised of a chair and 12 members appointed by the Minister of Health for a period of four years.

Healthcare Improvement Scotland, Scotland (157;158)	• National healthcare improvement organization responsible for scrutinizing activity within the Scottish health system and providing quality-improvement support to healthcare providers and organizations	• Supporting and empowering people to have an informed voice in managing their own care and shaping how services are designed and delivered	• Governed by a board of 13 members including a chair that is appointed by the Ministry for Health • Funding for Healthcare Improvement Scotland comes from the broader NHS budget

Country and council name	Mandate	Strategic priorities	Governance structure
		• Delivering scrutiny activity which is fair but challenging and leads to improvements for patients • Providing quality-improvement support to healthcare providers • Providing clinical standards, guidelines and advice based upon the best available evidence	

Evidence >> Insight >> Action

Table 5: Summary of features of international examples of quality council

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

National Health Service Quality Improvement (NHSQI) (*has since become NHS Sustainable Improvement Team) (113-116)	• Governance arrangements
	  o Consumer and stakeholder involvement
	    ▪ Organizes networking portal for commissioners, professional and consumers
	• Financial arrangements
	  o Influencing funding models
	    ▪ Capitated budgets for long-term care
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Monitoring and reporting on outcomes of NHS England's review
	  o Packages of care
	    ▪ Optimizing pathways and transitions in care
	    ▪ Review current prescribing models
	    ▪ Electronic Palliative Care Coordination System
	    ▪ Cardiovascular Disease Outcomes Strategy
		• Support the wider health and social care community to address inequalities and unwarranted variation in mortality and survival rates
		• Improving coordination of end-of-life care through the Electronic Palliative Care Coordination System
		• Develop the evidence base for a capitated budget approach within long-term conditions for people with complex needs
		• Support commissioners and providers to transform person-centred care for people with long-term conditions and their carers through Long Term Conditions Improvement Program
		• Support commissioners in moving towards the delivery of patient-centred care including improving transition of care and optimization of care pathways
		• Online resources for patients, carers and citizens to learn and share participation skills and practice
		• Portal for access to good practice tools, resources and networking to enable commissioners, providers, patients
			• None identified	• None identified

NHS Sustainable Improvement	• Governance arrangements o None identified • Financial arrangements	• None identified	• None identified	• None identified

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
Team, England (113-116;118) *Note that this only transitioned from NHSQI in 2015 and we were not able to identify detailed information about it	o None identified • Delivery arrangements o None identified			
Advancing Quality Alliance (AQuA), England (122;159)	• Governance arrangements o None identified • Financial arrangements o Funding organizations ▪ Grant for Whole System Flow Improvements • Delivery arrangements o Packages of care ▪ Re-design and optimization of patient pathways o Quality and safety monitoring and improvement systems ▪ Targeted data collection and monitoring ▪ Advancing Quality Program ▪ Mental health waiting and access times standards o Supports for safe workplace conditions and patient safety ▪ Restraint reduction program o Packages of care	• Funding for pilot programs that focus on whole system improvements • Quality-improvement training for clinicians that is focused on clinical skills and then quality-improvement training for board members or governing body members on quality improvement in organizations • Multi-day training for clinicians and for boards and governing body members on quality improvement • Development of standards for mental health wait times • Support for reducing the use of restraints in mental health wards	• Evaluations commissioned on an ad hoc basis at the program or project level by The Office of Public Management	• Recently conducted evaluation of "Leading Integrated System Level Change Program" which sought to support integration between NHS, social care commissioners and their providers in local areas • The evaluation found that: o economies of scale came to the program having made achievements in developing integrated ways of working o participants were able to maintain and develop relationships across partners o participants reflected that the program and its key concepts would be applicable to other domains of health and social care o despite satisfaction with the program, take up was lower than anticipated with many reporting that there was insufficient communication around benefits, the timing of this work not aligning with local activities and multi-agency teams not being

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Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
	▪ Person-centred pathways			sufficiently engaged to make use of the work

Care Quality Commission, (CQC) England (123-127;160)	• Governance arrangements
	  o Consumer and stakeholder involvement
	    ▪ Development of patient forum to exchange experiences in care and contribute inspection process
	    ▪ Experts by experience
	• Financial arrangements
	  o Funding organizations
	    ▪ Funding for pilot programs in coordinated care and new models for primary care
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Hospital, GP and care home registry
		• None identified	• Evaluated by National Audit Office under National Audit Act
			• The Care Quality Commission is required to submit an annual report
			• The Head of the Internal Audit group is required to prepare an annual report which is submitted to the Board and the Department of Health on risk management, control and governance
				• Commission uses data effectively to plan inspections
				• Since responding to criticisms, the commission's governance structures and processes are now consistent with most best practices
				• Commission published in its 2015/16 business plan a comprehensive and logically structured performance framework
				• Deemed not to be providing good value for money in 2011
				• Several changes to the commission's capability and regulatory model have been implemented
				• Limitations in national datasets restrict the commission's full potential

Agency for Healthcare Research and Quality (AHRQ), United States (128-133)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o Funding organizations
	    ▪ Provide funding for research, pilot project and education on health services and quality improvement
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
		• Provides patients with information on getting diagnosed, having surgery, taking medications and using hospitals as well as up-to-date patient-friendly information on improving their health
		• Supports patient involvement in care through information on communicating with providers
		• Provides clinical information about evidence-based practice,
			• Evaluations of the AHRQ are completed by third-party organizations at the program level
			• The AHRQ releases a public Annual Report, Fiscal Spending Report and Operating Plan each year
			• The Office of Audit Services is responsible for independent audits of Health and Human Services
				• Evaluation of AHRQ quality indicators found they were technically sound, sensitive to limitations of underlying data and transparent
				• AHQR is regarded as an intellectual leader and go-to institution for health services research and the use of administrative data for hospital quality measurement
				• It was seen as positive that a federal institution had defined open-source and well-documented standards

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	o Collects data on and measures healthcare quality and consumer assessment of health services and public reports on results
	o Uses quality measures, standards and indicators
	o Conducts evaluations based on monitoring of quality indicators
	  ▪ Publish public data reports and info graphics on how (and with what quality) healthcare is delivered
	o Supports for safe workplace conditions and patient safety
	  ▪ Tools for monitoring medical errors
		medical effectiveness and pharmaceutical therapies
		• Implements tools for monitoring medical errors and promoting patient safety
			programs and their grantees and contractors	• AHQR's Comprehensive Unit Based Safety Program provided evidence-based safety practices and tools to improve teamwork among doctors, nurses and other members of the healthcare team

Institute for Healthcare Improvement (IHI) (161-164)	• Governance arrangements o None identified • Financial arrangements o None identified • Delivery arrangements o Quality and safety monitoring and improvement systems ▪ Onsite diagnostics for assessing current performance and determining recommendations for performance improvement	• Provides education opportunities including conferences, in-person courses, virtual training, audio and video programs to providers, manager and health system stakeholders • Hosts learning and networking opportunities for partner organizations • Hosts a library of improvement resources for mid-level managers and executives • Publishes white papers, journal articles and case studies to support the spread of ideas and innovations of organizations	• None identified	• IHI global trigger tool was found to improve the detection of multiple types of adverse events when compared to previous trigger tools that used a focused approach to detect specific types of adverse events • The trigger tool evaluation identified that the tool relies heavily on a reviewer's ability to identify the specific events in a patient's record that could cause harm • A project evaluation of a collaboration between IHI and Ghana's National Catholic Health Service to improve maternal and

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
	▪ Support for large-scale improvement initiatives including planning and campaigning to mobilize large groups towards a common goal ▪ Develops sets of clinical quality measures as well as patient and staff satisfaction measures • Develops a variety of self-assessments and exercises to support organizations in identifying areas for quality improvements	affiliated with Institute for Healthcare Improvement		child outcomes found improvements when scaled up across northern Ghana in early antenatal care, skilled deliveries and under-five mortality • Implementation and monitoring of the Triple Aim framework and associated measurements in two case studies (Bellin, Wisconsin and Chenle Service Unit - part of the Indian Health Service) saw significant improvements in population health, experience of care and per capita cost. • In Bellin, improvements were observed in health risk appraisal scores, percentage of wellness certificates (measure of experience of care), and a reduction in the cost per employee plan. • In the Chenle Service Unit, no change was observed in self-reported health status, though a reduction was observed for both incidence of diabetes and urgent care visits.

Australian Commission on Safety and Quality in Health Care, Australia (136-138)	• Governance arrangements
	  o Policy authority
	    ▪ Develop and enforce Australian Charter for Healthcare Rights
	  o Training and licensure
	    ▪ Develop accreditation, national safety and quality health services standards
		• Provide education models and information for patients and providers on end-of-life care
		• Build clinical capacity in professionals to address skill or knowledge-based gaps in infection control across healthcare settings
		• Developed indicators for quality use of medicines in hospitals, resources to support electronic medication management and a
			• Performance is measured at the project level through project reports
			• Project reports are managed by the commission's executive staff and are regularly provided to the Audit and Risk Committee
				• In the 2015/2016 fiscal year the commission successfully delivered on its work plan
				• The annual report for 2015/16 highlights, among others, the following outcomes:
				  o greater number of organizations are being accredited by NSQHS standards

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	▪ Develop standards for credentialling and defining scope of clinical practice for medical practitioners
	▪ National standards for the accreditation of general practice
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Packages of care
	    ▪ Develop standards for end-of-life care
	  o Quality and safety monitoring and improvements systems
	    ▪ Develop National Surveillance Initiative to monitor healthcare-associated infections
	    ▪ Administers Clinical Quality Registers which gather, analyze and make widely available information about the care provided
	    ▪ Monitors accreditation, safety and quality standards
	    ▪ Develop and update standards for clinical care, mental health, credentialling and defining scope of practice, and falls prevention
		national standards medication chart
		• Provide supports to engage patients in their care through shared-decision making modules and courses
				o implementation of standards has resulted in national improvements in patient safety and quality of care between 2010 and 2014 including, among others, a decrease in Staphylococcus cases and central line associated infections

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
	▪ Indicators for use of medicines in hospitals, resources to support electronic medication management o Supports for safe workplace conditions and patient safety ▪ Develop unique processes for matching patients to their intended procedure or treatment			

New Zealand Health Quality & Safety Commission, New Zealand (139-142;160;165)	• Governance arrangements
	  o Consumer and stakeholder involvement
	    ▪ Supports consumer participation and decision-making about health and disability services at every level though consumer networks, health literacy training programs
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Establishes baseline measures (safety and quality markers, atlas of variation, quality accounts) and indicators which can be used to
		• Develop monitoring systems, tools and resources for medicine reconciliation, medication charts, electronic medicines management and medication alerts
		• Conducts evaluations of reported falls for older adults, and hosts learning collaborative between facilities to learn from best practices in falls prevention
			• Develops an annual Statement of Performance Expectations for which quarterly report summaries are developed
			• Required to present annual report on all outputs
			• Report is reviewed by House of Representatives pursuant to Public Finance Act
				• The most recent annual report and quarterly summaries reported that:
				  o quality and safety markers are a cost-effective measure of the performance of programs
				  o mortality review committees have been important in identifying opportunities to prevent deaths and have shown the rate of infant deaths from 20 weeks of pregnancy to 28 days old has fallen to the lowest number since reporting began in 2007
				  o quality and safety markers resulted in significant improvements across most of the process markers and improvements for some outcomes
				  o as a result of quality standards and monitoring, a reduction has been seen in orthopedic surgical site infection

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations
	assess the quality of the health system ▪ Monitoring to reduce medication errors ▪ Develops and monitors standards for hand hygiene, prevention of central line associated bacteraemia and surgical sites ▪ Provides adverse incident reporting and tools to facilitate reporting within organizations			
Swedish Agency for Health and Care Services Analysis, Sweden (143-146)	• Accountability arrangements o None identified • Financial arrangements o None identified • Delivery arrangements o Quality and safety monitoring and improvement systems ▪ Monitoring and reporting on national reforms and initiatives	• Problem-based analysis and review on select health system issues • Structured national and international comparison reports	• Development of an annual analysis plan detailing the main tasks and urgent areas for analysis and review • Areas are developed in consultation with the patient advisory council and approved by the board and government • Analysis Plans are followed up by an annual report which details the extent to which the organization met its stated mission	• None identified
The Danish Institute for Quality and Accreditation in Healthcare, Denmark (147;160;165;166)	• Governance arrangements o Training and licensure ▪ Accreditation of hospitals, community pharmacies, community-based healthcare, pre-hospital sector, general	• None identified	• Standards for accreditation are to be revised every three years • No full program evaluation has been planned	• It is expected that the program has had a positive influence on the quality of health services and institutional culture as to learning for adverse incidences

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	practitioners, and specialist physician practice
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Develops and publicly reports on accreditation standards			

Organization for Transparency and Quality in Health Care, Germany (148;167)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Develop reports on quality of the health system and comparisons across quality in the country
		• None identified	• Required to deliver a general progress report to the Federal Joint Committee giving an overview of the work processes and demonstrating results of the institute	• None identified

Institute for Quality and Efficiency, Germany (148;150;150;151;151;153;154;160;165)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o None identified
		• Identifies best available evidence on drugs and medical interventions through rapid reports
		• Provides guidelines and guideline review for the adoption of new medication, medical interventions and technology
		• Evaluation of the quality of health services across the health system
			• Joint Federal Committee of physicians and health insurance funds and the Ministry of Health are responsible for evaluating the work of the institute
			• Additionally, the institute publishes publicly available annual reports that report on predetermined outcomes and programs of work
				• None identified

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

Regulation and Quality Improvement Authority, Northern Ireland (155;156;168)	• Governance arrangements
	  o None identified
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Maintains health and social care registries including nursing homes, residential care homes and domiciliary care agencies
	    ▪ Conducts inspection of health and social care services to assure the quality of services, as well as of registered services, mental health and learning services, hospitals, radiology and criminal justice
	    ▪ Operates a three-year review program that examines the quality, safety and availability of health and social care services Clinical audits
		• Perform clinical audits, and for health and social care organizations	• Authority produces Corporate Plans that set out objectives and targets over a three-year period
			• Subject to ad hoc independent audits/reviews of performance
				• An on-going need was identified for the functions of the Regulation and Quality Improvement Authority to support the continuous improvement in the quality of health and social services
				• Recommendations of the authority are effective in that they help to "drive up the standards of health and social care"
				• Hygiene inspections have been found to contribute to patient safety
				• Communication between the authority and the Department of Health and Social Services is generally very effective with bi-monthly and annual performance management meetings
				• Some confusion exists in the health sector about the processes and procedures that should be followed once the authority submits an inspection report or a review
				• Some stakeholders feel that research conducted is not sufficiently robust to provide recommendations that were fully implementable and could significantly improve the quality of care

Healthcare Improvement Scotland, Scotland (157;158)	• Governance arrangements
	  o Accountability
	    ▪ Provides advice to NHS Scotland boards for decision-making on the adoption of technologies
		• Provides tailored support for NHS boards including reviewing and evaluating their approach to involvement, and communicate engagement
		• Development and updating of guidelines based on best available
			• Required to produce annual accounts, annual scrutiny inspection plans and annual reports that parallel and build on the three-year strategic plans	• None identified

Country and council name	Supports for advancing quality		Accountability for advancing quality	
	Health system arrangements to advance quality	Programs to advance quality	Approach to evaluating quality agencies	Successes and limitations identified from evaluations

	▪ accept for use in National Health Service Scotland, newly licensed medicines that represent good value for money
	o Consumer and stakeholder involvement
	  ▪ Hosts a centre for the exchange of knowledge, support, development and ideas
	  ▪ Incorporates the experiences of patients, their families and carers in making decisions about funding medicines
	  ▪ Forum for patient and citizen contribution to National Health Service boards and board decision-making through the Participation Network
	• Financial arrangements
	  o None identified
	• Delivery arrangements
	  o Quality and safety monitoring and improvement systems
	    ▪ Carries out safety and cleanliness inspections across National Health Service Scotland hospitals and services as part of the Healthcare Environment Inspectorate
		clinical evidence for NHS Scotland		

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APPENDICES

The following tables provide detailed information about the systematic reviews identified in the rapid synthesis, which includes the focus of the review, key findings, last year the literature was searched and the proportion of studies conducted in Canada.

For the appendix table providing details about the systematic reviews, the fourth column presents a rating of the overall quality of each review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial or governance arrangements within health systems. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered "high scores." A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8).

All of the information provided in the appendix tables was taken into account by the authors in describing the findings in the rapid synthesis.

Appendix 1: Summary of findings from systematic reviews

Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
Effectiveness of quality-improvement collaboratives in enhancing the quality of care (13)	The review included nine controlled trials, which found a moderate positive effect of quality-improvement collaboratives on processes of care and patient outcomes. This review additionally examined the findings of 60 uncontrolled reports, of which 53 trials indicated specific improvements in patient care and organizational performance due to participation in a quality-improvement collaborative. Several of the reports demonstrated dramatic improvements (i.e., 30 to 80%), but most of these uncontrolled reports were found to be methodologically weak and were likely biased in favour of positive findings. A quality-improvement collaborative intervention brings together multidisciplinary teams from various healthcare departments or organizations to allow them to collaborate for several months in a structured working environment, with the aim of improving the provision of their care. They are being used increasingly in countries such as Australia, Canada, the United Kingdom and the United States. Quality-improvement collaboratives have been used in various clinical areas and organizational contexts, and within both large and small healthcare systems.	2006	4/11 (AMSTAR rating from www.rxforchange.ca)	Not reported in detail
Contextual factors associated with quality-improvement (QI) success (15)	The review revealed that the current body of work is in the early stage. Common factors that were used in studies to relate to QI success include organizational characteristics (e.g., size, ownership, teaching status), leadership from top management, competition, organizational culture, years involved in QI and data infrastructure. Factors that were consistently examined to be associated with QI success, but reported less frequently, include board leadership for quality, organizational structure, customer focus, physician involvement in QI, microsystem motivation to change, resources, and QI team leadership. Researchers state that current research suffers from conceptual ambiguity and methodological weaknesses. As a result, they could not make definitive conclusions about the influence of specific contextual factors in QI success. This review included studies that examined the association between contextual factors and success in the setting of a healthcare QI initiative. Authors define QI as "systematic, data-guided activities designed to bring about immediate, positive changes in the delivery of health care." In terms of organizational setting, included studies were based in inpatient clinics (57%), nursing homes (21%), outpatient clinics (9%), both inpatient and outpatient clinics (6%), and other settings (6%). In terms of particular QI success measures, included studies examined the extent of implementation of QI practices (32%), perception of success or improvement (40%), adoption of Total Quality Management (15%), superior organizational performance or outcome (11%), pre/post process or outcome changes (19%), and other (2%).	2009	7/10 (AMSTAR rating from McMaster Health Forum)	4/47
Effectiveness of various quality-improvement strategies for enhancing healthcare (14)	This review sought to assess the published literature assessing the relative effectiveness of various quality-improvement strategies (QIS) as applied to patients with medical conditions in the setting of formal clinical studies. Systematic reviews of controlled trials were selected in determining effect sizes for specific QIS, which were compared as a narrative meta-review.	2008	2/11 (AMSTAR rating from McMaster	Not reported

Evidence >> Insight >> Action

	Research evidence suggests clinician/patient-driven quality-improvement strategies are more effective compared to manager/policymaker-driven approaches. However it must be noted that manager/policymaker-driven approaches have, in many cases, attracted inadequate rigorous evaluations to accurately determine their comparative effectiveness. The most effective quality-improvement strategies included clinician-directed audit and feedback, decision support systems, clinical practice guidelines, specialty outreach programs, chronic disease management programs, and the use of small-group discussions in continuing professional education.		Health Forum)	
Quality-improvement models in health care (16)	The review suggests there is a broad set of conditions that need to be in place for successful implementation of quality-improvement models in healthcare. These include: provision of the practical and human resources to enable quality improvement; the active engagement of health professionals, especially doctors; sustained managerial focus and attention; the use of multi-faceted interventions; coordinated action at all levels of the health care system; substantial investment in training and development; and the availability of robust and timely data through supported IT systems. The success of implementation also depends crucially on the interaction between local context and approach being applied. Any of the programmed approaches to quality improvement requires recognition of the generic characteristics of all healthcare organizations that make the quality improvement particularly challenging in this field. It also requires careful consideration of local circumstances to determine the model or approach that provides the 'best fit' locally. Finally, it requires the application in the local context in a programmed and sustained way, which may include considerable adaptation of the approach to suit local circumstances and respond to emerging developments.	Not reported	2/9 (AMSTAR rating from McMaster Health Forum)	Not available
Effectiveness of structural quality in quality assurance (17)	No key findings extracted given that the review is written in German	2000	Unable to assess given article written in German	Unable to assess given article written in German
Public engagement in priority setting and resource allocation (19)	As the literature covers all levels of government, decision-makers are likely to find information relevant to their own setting and situation. The pressures that decision-makers face to satisfy demands for a greater public role in priority setting is indicative of their involvement in public-engagement processes. Most decision-makers use multiple methods to engage multiple publics, and according to the researcher's perspective, it provides a balance that may lead to a more rounded understanding of the public's desires. In addition, the willingness to seek public input in an ongoing, sustainable fashion over time provides a promising way of obtaining public engagement in priority setting. Public engagement is most common at the visioning or goal-setting level, and in specific decisions about sites or programs, but is less common in monitoring and evaluation activities. Consultations are typically one-off rather than ongoing, and not likely to involve the public in direct face-to-face interaction with decision-makers. Costs are seldom reported, but well-structured processes can range from tens of thousands of dollars to the million-plus range.	2006	4/10 (AMSTAR rating from McMaster Health Forum)	Not reported in detail
Setting priorities for health interventions in developing countries (22)	This study reviewed empirical studies on priority setting of health interventions in developing countries, classified their methodological approaches and defined methodological suggestions for future studies. The studies covered a wide range of priority-setting areas: 10 studies prioritized interventions across the healthcare system, four studies across several disease areas and four studies concentrated on particular disease areas. Most of the identified studies (14/18) focused on priority setting at the national level.	2008	2/10 (AMSTAR rating from McMaster Health Forum)	1/18

	Findings show that most of the included studies involved policymakers, health workers and the general population in their priority-setting process. This coincides with observations in the literature which emphasize the need to involve relevant stakeholders in these debates. Additionally, a number of studies involved only a limited number of quantitative criteria, whereas observations in the literature stress that many other criteria, including medical (e.g. effectiveness of interventions and severity of disease) and non-medical (e.g. economic efficiency, ethical reasons and political circumstances) criteria, may also be important to consider. Furthermore, some studies identified criteria through literature review, however the definitions of criteria are likely to be dependent on culture and perspective. As such, authors suggest identifying these criteria through focus group discussions with relevant stakeholders as a better approach to obtain an appropriate set of criteria. It was also found that a number of studies relied solely on quantitative techniques to elicit preferences of respondents. Weighing the strengths and weaknesses of both approaches, authors suggest that quantitative techniques may be relevant to situations where general guidance on priority setting is required, whereas qualitative techniques may be more apt in situations where more specific decisions are required on, for example, implementation of certain interventions. Lastly, a number of studies presented their results in descriptive format such as identified criteria or respondents' preferences, and authors suggest that studies should also present the impact of their findings in this respect.			
Priority setting for health technology assessments (20)	A majority (7/12) of priority-setting frameworks used a panel or committee to provide advice regarding priorities. In all cases, committees contained representatives from healthcare system funders, health professionals and researchers. Advice from a board of directors was used in four priority-setting systems and in conjunction with a committee in two of these. Four of the 12 frameworks identified used a rating system to inform priorities. In all cases, these were used in conjunction with a committee. Two systems explicitly considered the cost benefit of conducting the assessment in deciding priorities. Eleven categories were identified for priority-setting criteria (listed in descending order of prevalence): clinical impact, economic impact, disease burden, budget impact, evidence, expected level of interest, timeliness of review, variation in rates of use, controversial nature of proposed technology, ethical, legal, or psychosocial implications, and alternatives.	2007	4/10 (AMSTAR rating from McMaster Health Forum)	3/17
Describing priority-setting processes for healthcare that either exist or have been tried in different jurisdictions around the world (21)	Priority-setting processes were identified as both formal and informal at national/state and regional levels. Formal processes began with the assembly of a government-appointed committee and identified principles and factors to be considered during priority setting (values such as equity, solidarity, equality, effectiveness/benefit and efficacy of healthcare services under review). Informal approaches comprised informal debates, discussions among policymakers, and a one-off consensus development meeting. Tools for generating a list of priorities, which relied heavily on data, were found to be impractical and conceptually difficult to understand by decision-makers.	2005	3/10 (AMSTAR rating from McMaster Health Forum)	1/30
Defining the benefits of stakeholder engagement in systematic reviews (23)	This review sought to examine the benefits and challenges of engaging stakeholders in the process of developing and performing systematic reviews. Benefits cited include: identifying and prioritizing topics for research; providing pragmatic feedback on the research protocol; aiding in recruitment of research participants; helping the researchers understand the research subject's perspective; ensuring that findings are interpreted with the end user in mind and that final products are readable and accessible; and facilitating wider dissemination and uptake of research findings. In particular, the topic refinement and research development phase of conducting a systematic review was identified as the point where stakeholder engagement yielded the greatest benefit. Challenges include time and resources, researcher skills for stakeholder engagement, finding the right people, balancing multiple inputs, and understanding the best/most appropriate time in the review process to engage different types of stakeholders. Additionally, it was found that very few studies directly measured the impact of or had quality standards for stakeholder engagement, with most relying heavily on observations and inferences.	2013	5/9 (AMSTAR rating from McMaster Health Forum)	4/24

Stakeholder involvement in program evaluation (24)	A review of 41 studies on the involvement of stakeholders in program evaluation consisted of reports of original research on stakeholder involvement, independent of actual evaluations, or reports of actual evaluations or meta-evaluations. There is a small percentage of studies reporting original research. Nearly half of the reviewed studies were set in health or education. The dominance of these disciplines suggests that stakeholder involvement is emphasized to a greater extent within these disciplines. Considerable overlap was found between the component and component features that the studies addressed, reflecting a conceptive commonality among researchers of stakeholder involvement. The component, *Affective Aspects of Involvement and Collaboration, Communication, and Interaction*, where parties "enter into collaboration with the appropriate degree of willingness to participate …draw on the strengths of each while respecting the positions and expertise of each other", reflects the methodological centre of stakeholder involvement. The review found very little research on stakeholder involvement in evaluation. The limited number of studies reviewed should not be taken to imply that stakeholder involvement has received little attention in the broader literature.	2010	4/9 (AMSTAR rating from McMaster Health Forum)	Not reported in detail
To assess the effectiveness of community engagement models in improving health of disadvantaged populations (42)	The review identified 11 categories of community engagement (CE) initiatives, including community-partnered participatory research, community health worker model, community empowerment model, community action cycle, youth developmental model, the Well London model, participatory action cycle, the Families in Our Community United for Success (FOCUS) model, the Culturally appropriate Diffusion Communication model and the Analysis Grid for Elements Linked to Obesity (ANGELO). Over half of the studies included in this review (14 studies) showed that CE-informed research led to reductions in health inequalities, by improving health behaviour and outcomes among disadvantaged populations bearing burden of disease. Factors facilitating effectiveness of CE models included partner input in intervention design, shared learning between academic and community partners, and bridging people on research teams. The important CE components that affected health outcomes included real power-sharing, collaborative partnerships, bidirectional learning, incorporating the voice and agency of beneficiary communities in research protocol, and using bicultural health workers for intervention delivery.	2015	6/10 (AMSTAR rating from McMaster Health Forum)	1/24
Components of quality-improvement collaboratives on outcomes at the patient or provider level (26)	The review identified 14 common components in quality-improvement collaboratives (QICs) in healthcare, including in-person learning sessions, phone meetings, data reporting, feedback, training in quality improvement methods, and use of improvement methods. The review identified studies reporting that QICs can induce change at the provider level, particularly in process of care variables (e.g., medication management, patient education, tracking of preventive actions). As well, with regards to cost, there were findings of favourable incremental cost-benefits in a collaborative on diabetes care. However, few studies directly assessed patient outcomes.	2012	4/11 (AMSTAR rating from McMaster Health Forum)	1/27
To assess the effectiveness of regional surgical collaborations for improved care quality and outcomes (25)	A community of practice framework incorporating the success elements can be used as a model for collaboration amongst surgeons and healthcare organizations to improve quality of care and foster continuing professional development. Significant improvements in clinical outcomes, such as decreases in mortality rates, lower duration of post-operative intubations, and fewer surgical-site infections were reported.	2006	4/11 (AMSTAR Rating from www.rxforchange.ca)	0/7

Explore relevance of different models of clinical governance to Australian primary health care quality and safety (27)	The review found that the current evidence base for clinical governance is limited and focuses mainly on process rather than outcomes (i.e. enhancing safety, efficiency, sustainability and economics of primary health care). As well, most evidence originates from high-income countries and support governance models that use targeted, peer-led feedback on clinician practice. There is also limited information on the impact of clinical governance on chronic disease management, care of the elderly and mental health care.	2010	2/10 (AMSTAR rating from McMaster Health Forum)	0/19
Deliberative dialogues as a mechanism for knowledge translation and exchange in health systems decision-making (28)	The model developed in the review outlines three key features of deliberative dialogues, which include ensuring an: 1) appropriate meeting environment (e.g., by ensuring adequate resources, commitment from participants, transparency, timeliness of the issue, appropriate group size, clear meeting rules, pre- and post-meeting tasks and effective facilitation); 2) appropriate mix of participants (e.g., by ensuring fair and balanced representation of those with an interest in the issue, and that participants are motivated and provided with the resources they need to meaningfully engage in the issue); and 3) appropriate use of research evidence (e.g., fostering a clear understanding of the policy issue among all participants by presenting what is currently known about it based on the best available research evidence). The model further outlines several intended effects of deliberative dialogues, including short-term (e.g., strengthened capacity of participants to address the policy issue), medium-term (e.g., strengthened community or organizational capacity) and long-term effects (e.g., strengthened system capacity to make evidence-informed decisions)	2009	No rating tool available for this type of synthesis	4/17
Examining the evidence of effectiveness among three current popular transformational strategies applied in healthcare organizations: Six Sigma, Lean/Toyota Production System, and Studer's Hardwiring for Excellence (32)	The implementation of the transformation strategies examined (Six Sigma, Lean/Toyota Production System, and Studer's Hardwiring for Excellence), was successful in improving healthcare-related processes and outcomes across a wide range of settings, and for a wide range of problems. The results must be considered with some caution as the included studies in this review had methodological limitations.	2007	1/10 (AMSTAR rating from McMaster Health Forum)	0/19
Determining the factors that facilitate large health system transformations (33)	The review found five key themes related to the factors that facilitate large-scale system transformation in health systems, including: 1) system transformation requires top-down leadership that is passionately committed to change, as well as distributed leadership and engagement of personnel at all levels of the system; 2) measurement and reporting on progress toward short- and long-term goals is critical to achieving effective and sustainable large-system transformation; 3) awareness and consideration of historical context will help to avoid unnecessary pitfalls associated with system transformation, and will also help to ensure buy-in and support from necessary stakeholders; 4) large-system transformation relies on significant physician engagement; and 5) if large-system transformation aims to increase patient-centredness, patients and families must be engaged in the transformation process.	2010	3/9 (AMSTAR rating from McMaster Health Forum)	Not reported
Identifying empirical and theoretical articles to present a comprehensive overview of issues highlighted in relation to	Lean is best understood as a means to increase productivity, with an emphasis on driving out waste so that all work adds value and serves the customer's needs. In the realm of healthcare the hospital setting has been the most common setting for implementing and evaluating the management model.	2013	2/9 (AMSTAR rating from McMaster	Not reported in detail

the implementation of the Lean model in healthcare (31)	The results of Lean application in healthcare are generally positive, but many findings are also inconclusive with respect to defining specific positive impacts or challenges. Little is known about the potential downsides of Lean, the magnitude of investment required to implement the model, and/or challenges in engaging the whole organization during implementation.		Health Forum)
Identifying and evaluating the application and effectiveness of quality-improvement initiatives from the manufacturing industry in the field of surgical healthcare (30)	Studies identified included a number of different quality-improvement models, including: 1) continuous quality improvement (CQI); 2) Six Sigma; 3) total quality management (TQM); 4) plan-do-study-act (PDSA or plan-do-check-act (PDCA); 5) statistical quality control (SQC); 6) Lean; and 7) Lean Six Sigma.

The most common aims of the studies were to reduce surgical complications and improve surgical outcomes, reduce infections, or reduce theatre delays. The strategies evaluated were shown to have significant positive effects on improving surgical care, from reducing infection rates to increasing operating room efficiency, although stronger evidence is needed from rigorous randomized multicentre studies. | 2010 | 5/10 (AMSTAR rating from McMaster Health Forum) | 0/34 |
| Effectiveness of community-engagement approaches and methods for health-promotion interventions (41) | There is little evidence on the effects of specific interventions on health promotion. Varying qualities of evidence suggest that interventions that engage the community improve the dissemination of information and the development of interventions. The review includes no evidence regarding the effectiveness of community-engagement approaches and methods for health-promotion interventions with regards to optimizing clinical practice.

The evidence from one study suggests that community champions used in planning/design or delivery of health-promotion interventions can increase their level of knowledge, skills and confidence following training, and feel that they make the greatest impact in areas in which they have ownership and a stronger voice within their communities.

The community-engagement approaches reviewed included the use of community groups, committees, educators, volunteers, workshops and champions. In addition, the community-engagement methods and approaches focused on the planning, design and delivery of intervention(s) in areas of cardiovascular health, childhood immunization, injury prevention, sexual health, smoking, alcohol use, nutrition and physical activity. | Not reported (published in 2008) | 9/10 (AMSTAR rating from McMaster Health Forum) | 4/21 |
| Effective strategies for interactive public engagement in developing healthcare policy and program delivery at a provincial/regional level (34) | Interactive public engagement designed to contribute to decision-making can be successfully implemented in various situations. The relative success of implementation is influenced by a range of contextual variables, of which organizational commitment and issue characteristics play more important roles than other contextual variables. In well-designed interactive public-engagement processes, participants generally report high levels of satisfaction with the communication of objectives, adequacy of the information materials, and the logistics of the deliberations. These public-engagement methods can influence participant views, but are less likely to alter dominant views, such as the highest priorities. Researchers note that continued ambiguity in the terminology, goals, theoretical properties and benefits of public engagement amongst Canadian health-system managers and policymakers will threaten potential meaningful progress towards informing practice and involving the public in the development of healthcare programs. | 2009 | 4/9 (AMSTAR rating from McMaster Health Forum) | ? |
| Examining the peer-reviewed empirical evidence on outcomes of public involvement in healthcare policy (36) | The outcome of public involvement in healthcare policies remains largely underdeveloped and poorly documented. There is little to no evidence for the longer-term impact demonstrated by public involvement. There is no clear conclusion on the effectiveness of policy development from involvement activities. The review includes no evidence regarding the effectiveness of public involvement with regards to optimizing clinical practice.

There is some evidence for the developmental role of public involvement (e.g. enhancing awareness, understanding and competencies among lay participants), but the unclear definition of success impedes on forming a conclusion about public involvement. | 2010 | 4/9 (AMSTAR rating from McMaster Health Forum) | 5/19 |

	There is limited data available to address the primary research questions. The key features of public involvement remain poorly defined, and its objectives are rarely specified in the literature. Indicators used to determine outcomes of this form of intervention remain inconsistent and poorly specified.			
Examining the effects of involving patients in the planning and development of healthcare (37)	A review of 337 studies involving patients in the planning and development of healthcare found that few studies described the effects of involving patients in the planning and development of healthcare. The review defined patient involvement as "the active participation in the planning, monitoring, and development of health services of patients, patient representatives, and wider public as potential patients." Case studies reporting on project administrators' views about the impacts of patient engagement support the view that involving patients has contributed to changes to services. An evidence base does not exist for the effects on use of services, quality of care, satisfaction, or health of patients. The effects of patient involvement on accessibility and acceptability of services or impact on the satisfaction, health or quality of life of patients, has not been examined. The effect of patient contributions to the planning and development of services on the quality and effectiveness of these services across various settings is unknown.	2000	5/9 (AMSTAR rating from McMaster Health Forum)	2/42
Public deliberation as a method for increasing public input for health research (35)	Public deliberation is presented in the literature as a specific area of political science, and it encourages members of the public to engage in and be informed about issues that shape their public life. Evidence remains consistent in suggesting that public deliberation is a method of obtaining public input on decisions that are important to society. The goals of public deliberation are to obtain informed public opinion, to obtain input that includes under-represented individuals and groups, to bring insights into social values and ethical principles, and to promote the acceptance of public decisions. In addition, the effects of deliberation on participants improve understanding of the complexity of decisions and enhance civic-mindedness. Identified issues that are best suited for public deliberation involve ethical and social dilemmas. It is also important to note that the potential to find common ground is a requirement for issues addressed through public deliberation. Common deliberative tasks in healthcare include the development of policy direction, recommendations and tools, priority setting and resource allocation, and risk assessments. The process of public engagement is facilitated through discussion, and prompts the public to develop solutions to societal problems posed to them. It includes three broad characteristics: a sponsor seeking input from participants (i.e., the public); participants considering the ethical- or values-based dilemma; and an information phase in which participants are given accurate and balanced information about the relative positions involved by way of educational materials, experts, etc.	2010	1/9 (AMSTAR rating from McMaster Health Forum)	Not reported in detail
Effectiveness of the agenda of involvement of people affected by cancer in research, policy and planning, and practice (38)	Training of patients and healthcare professionals is necessary for successful involvement of cancer patients in research, policy and planning, and practice. Patient involvement requires personnel and financial support. The opposing ideologies of individualism and collectivism are the most common rationales as to why people affected by cancer should be involved in research, policy and planning, and practice. Some policy and planning, and research organizations have involved people affected by cancer at a strategic level, most notably in the U.K. and the U.S.A., but it is not clear how much power and influence they hold at a strategic level.	2004	4/9 (AMSTAR rating from McMaster Health Forum)	Not reported in detail

	'One-off' involvement exercises to influence local policy and planning have taken place in the U.K. in the acute sector, and at a national level to develop guidelines and services, but no examples were found in social care or primary care. The biggest gap in literature about the involvement agenda is rigorous evidence of its impact on research, healthcare services, on those involved, and on the agenda itself.			
Strategies in consumer and community engagement in healthcare (39)	This review used the term CCE to encompass the involvement of consumers (patients and their carers) and community members (i.e., non-patient community members and the community more broadly). The authors note that there remains a paucity of evidence related to the effectiveness of CCE strategies, and participation of different groups of consumers in the CCE process. CCE encompasses strategies that have been used to facilitate the improvement of the level of general service delivery and specific services within preventative care, technology, and related healthcare fields. Various tools and activities are utilized by CCE initiatives, including shared decision-making, decision aids, consumer representation, electronic and internet-based facility application, and peer support and community-based interventions. The review indicated that literature focusing on CCE strategies targeting children found that children and adolescents want to participate in their decision-making, but that healthcare professionals require guidance to assist in their involvement. When reviewing literature focusing on populations from lower socio-economic backgrounds, the authors noted that lowered costs, increased primary care physician involvement, and modification of communication to better meet individuals' needs were all strategies that facilitated enhanced cancer screening for women in one included study. The authors indicated that a key finding from the review is that CCE initiatives should be rigorously evaluated before their implementation, as they often require immediate resource mobilization and may have hidden costs associated with them (e.g., training healthcare professionals and consumers). Additionally, there are a number of context-related factors that play a role in the success of CCE strategies; the review outlines a model to facilitate assessment of these strategies (i.e., an eight-step process identifying aim, type of activity, participants, preparedness for CCE, engagement methods, measurement, barriers and facilitators).	Not reported	4/9 (AMSTAR rating from McMaster Health Forum)	Not reported in detail
The use of citizens' juries in health policy decision-making (40)	The review describes citizen juries as a method allowing citizens to engage with evidence and deliberate and deliver recommendations surrounding a variety of complex topics. Steering committees and advisory groups involved in the citizens' jury method described in the reviewed studies included key stakeholders (e.g., policymakers), discipline experts, advocacy group representatives, clinical practitioners, deliberative methodologists, patients and caregivers. Studies described the role of the groups in a variety of ways, such as to: prevent bias in expert presentation; guide question development and evidence presentation; disseminate or implement findings; and engage stakeholder representatives. The authors found that among the study population, a large number of juries were shorter in duration than recommended, and few rulings were considered by decision-making bodies (which limited transfer into policy and practice). The authors indicate that when adapting a citizen jury for a particular aim, development of the jury should involve special attention toward recruitment, independent oversight by a steering committee, duration of the jury, moderation, and respect for volunteer participants.	2010	5/9 (AMSTAR rating from McMaster Health Forum)	10/37
Effects of local opinion leaders on professional	Opinion leaders are individuals who are perceived as "likeable, trustworthy, and influential", and can aid and persuade healthcare providers to use evidence when treating and managing patients. The review found that	2009	10/10 (AMSTAR	6/18

practice and healthcare outcomes (47)	local opinion leaders alone and local opinion leaders with audit and feedback were found to be generally effective for improving appropriate care behaviour (based on 40 and five randomized controlled trial (RCT) comparisons respectively). Multifaceted interventions that included the use of opinion leaders in addition to one or more interventions had mixed results for improving appropriate care behaviour (based on 10 RCT comparisons). Moreover, the effectiveness of opinion leaders varies both between and within studies that have different types of interventions, settings and outcomes measured. In most studies included in this review, the role of the opinion leader was poorly defined, making it more difficult to optimize the effectiveness of these leaders. The use of a local opinion leader as the only intervention was evaluated in five studies. In 13 studies, local opinion leaders were supplemented by other interventions such as educational materials, outreach activities, audit and feedback, chart reminders, evidence summaries, seminars and lectures, and discussions. The time span of interventions ranged from one week up to 18 months. In most studies a description of the frequency of opinion leader involved was not provided. In most studies the opinion leader intervention was compared to no other intervention and therefore it is not possible to identify the best way to optimize the effectiveness of opinion leaders.		rating from McMaster Health Forum)
Effects of continuing education meetings and workshops on professional practice and healthcare outcomes (45)	Educational meetings (e.g., courses, conferences, lectures, workshops, seminars and symposia) for physicians and other healthcare professionals, alone or combined with other interventions, improved professional practice and the achievement of treatment goals by patients. Seven of 81 studies targeted interventions for improving the detection of cancer, and these studies did not find any statistically significant impact of educational meetings on professional practice. The effects on professional practice and patient outcomes were small and varied between studies. It appeared that higher attendance at meetings was associated with enhanced effects, that mixed education (interactive and didactic) was more effective than either alone, and that the effects were lower for more serious outcomes and complex behaviours.	2006	10/11 (AMSTAR rating from McMaster Health Forum)	4/81
Effects of on-screen, point-of-care computer reminders on processes and outcomes of care (49)	Computer reminders lead to a 4.2% median improvement in process adherence for all outcomes, 3.3% for medication ordering, 3.8% for vaccinations and 3.8% for test ordering. Generally, point-of-care computer reminders achieve small improvements in physician behaviour.	2008	9/11 (AMSTAR rating from McMaster Health Forum)	1/28
Whether different factors influence the effectiveness of educational outreach visits (EOVs), and whether adding another intervention to EOVs, such as the use of patient-mediated interventions or using manuals or computerized reminders to prompt clinicians to perform clinical actions, alters	Educational outreach visits allow trained persons to visit clinicians where they practice and offer them information on how to change their practices to improve how they care for their patients. The information offered might include feedback about their performance, or could be based on how to overcome obstacles in changing behaviours. Multifaceted interventions that included educational outreach and distribution of educational materials and/or other intervention, compared to a control group, compared to audit and feedback and compared to educational materials, were all found to be generally effective for improving appropriate care. Educational-outreach interventions used alone compared to a control group and compared to educational materials were found to be generally effective. There was insufficient evidence for comparisons of multifaceted versus educational meetings, educational outreach visits versus continuity of care, and multifaceted versus reminders.	2007	8/11 (AMSTAR rating from www.rxforcha nge.ca)	1/69

66

their effectiveness (46)	The authors concluded that educational-outreach visits alone or when combined with other interventions have relatively consistent and small effects on prescribing that are potentially important. The effects on other professional behaviours, however, appeared to be more variable. Additionally, the authors point out that while educational outreach visits may be costly, the savings may outweigh the costs if the intervention is targeted at inappropriate prescribing and its effects are enduring.		
Effects of audit and feedback on professional practice and healthcare outcomes (48)	The audit and feedback process consists of an individual's professional practice or performance being measured and compared to professional standards or targets (i.e., auditing of professional performance). The results of this comparison are subsequently delivered to the individual in hopes of encouraging the individual to follow professional standards (i.e., providing feedback). The process is often used in combination with other interventions such as reminders or educational meetings, and is often used in healthcare settings. Most of the studies included in the review measured the effects of audit and feedback on physicians, and some measured the effects on nurses or pharmacists. In all comparisons (audit and feedback alone compared to no other interventions, audit and feedback with educational meetings compared to no intervention, audit and feedback as part of a multifaceted intervention compared to no intervention, audit and feedback combined with complementary interventions compared to audit and feedback alone, and audit and feedback compared to other interventions) audit and feedback was found to be generally effective. However, the authors note that it is uncertain according to the evidence whether audit and feedback is more effective when used in combination with other interventions. Using multivariable meta-regression, the authors indicated that the effectiveness of feedback may increase when baseline performance is low, when feedback is provided more than once, when it includes both explicit targets and an action plan, when the source of feedback is a supervisor or colleague, and when it is delivered both verbally and in a written format.	2010	8/11 (AMSTAR rating from www.rxforchange.ca)	11/140
Effects of printed educational materials on professional practice and healthcare outcomes (44)	Printed educational materials are utilized to improve healthcare professionals' knowledge, attitudes, skills and awareness to improve practice and patient outcomes. Common means of presentation include paper formats (e.g., monographs), publications in peer-reviewed journals, and clinical guidelines. The review focused on passive dissemination of printed educational materials, which involves the distribution of published or printed recommendations for clinical care (including monographs, publications in peer-reviewed journals, and clinical practice guidelines) being delivered personally or through mass mailing. Most of the printed educational materials utilized in the studies were endorsed, did not specify an educational component, were printed in black and white with a few tables and figures, and were longer than two pages. The systematic review included 45 studies (31 of which were interrupted time series analyses and 14 randomized controlled trials), and nearly all included studies (44/45) aimed to compare the effectiveness of printed educational materials to no intervention. When used alone and compared to no intervention, the review found that printed educational materials have a small beneficial effect on professional practice outcomes. However, the review indicated that there is insufficient information to reliably estimate the effect of printed educational materials on patient outcomes. The authors also aimed to identify the influence of various characteristics of printed educational materials in determining the effectiveness of the intervention. It was noted that effectiveness may vary more according to source of information, tailoring, purpose, level of evidence and format, and that effectiveness may not vary much based on the frequency, mode or duration of delivery.	2011	8/11 (AMSTAR rating from www.rxforcha nge.ca)	12/50

		2009	7/11 (AMSTAR rating from www.rxforchange.ca)	2/26
Effects of tailored interventions to address barriers to change in health professional performance (50)	Tailored interventions to change professional practice are interventions planned following an investigation into the factors that explain current professional practice and any reasons for resisting new practice. These factors are referred to as barriers to change. It was found that the selection of interventions tailored to prospectively identified barriers is more likely to improve professional practice than no intervention or than dissemination of guidelines or educational materials alone. The overall effectiveness of such interventions, as indicated by the meta-regression, is modest. However, there is wide variation in effectiveness between studies and between the targeted behaviours within single studies, from lack of effect to relatively large effect. There is currently insufficient evidence on the most effective approaches to tailoring, including how barriers should be identified and how interventions should be selected to address the barriers. There is also no evidence about the cost-effectiveness of tailored interventions compared to other interventions to change professional practice. As such, authors recommend that it is reasonable to employ low-cost tailored interventions in practice, but that evidence on the cost-effectiveness of the alternative methods of tailoring is needed to justify the use of more costly tailored approaches. In 13 studies, more than one method was used to identify barriers. These methods include interviews with health professionals and occasionally patients (n=11), focus group interviews (n=10), questionnaire surveys (n=6), review of the literature (n=4), review of performance data (n=2), a meeting or workshop (n=2), and other methods including observation and consultation with an expert group (n=4). Some studies employed a variety of methods. The depth of investigation of barriers was categorized as low in six studies, moderate in 13, and high in seven. Studies reported barriers in the following EPOC domains: administrative concerns (n=13), clinical uncertainty (n=9), patient expectations (n=5), information management (n=3), sense of competence (n=2), financial disincentives (n=2), and other (n=15). Barriers in the 'other' category included negative staff attitudes, anxiety about changing practice, a perception that the clinical issue was not a priority, and advocacy of certain drugs by pharmaceutical companies. In terms of the influence of prospective identification of barriers on intervention design, six studies reported drawing on behavioural theory to guide the choice of strategies in response to the identified barriers. The other 20 studies made no reference to any theoretical foundation when developing interventions.	2009	7/11 (AMSTAR rating from www.rxforcha nge.ca)	2/26
Interventions to improve safe and effective medicines use by consumers (52)	Seventy-five reviews were included, and focused on interventions with diverse aims, including behaviour change support, risk minimization and skills acquisition. While no single strategy was found to improve all medicine-use outcomes across all diseases, populations or settings, medicines self-monitoring and self-management programs, simplified dosing regimens and directly involving pharmacists in medicine reviews appeared to be effective strategies. Delayed antibiotic prescriptions, practical management tools such as reminders and packaging, education or information combined with self-management skills training, counselling or other such strategies, and financial incentives were also associated with some positive effects, although effects were less consistent. Some strategies (e.g., directly observed therapy), providing information or education alone, were found to be relatively ineffective or to have variable effects (e.g., ineffective on medicine adherence but improving knowledge for informed medicines choices). Based on several studies, the authors concluded that there was some evidence supporting the effectiveness of financial incentives in terms of adherence, although with mixed results. Two studies suggested financial incentives targeting physicians were found to increase immunization rates. Three reviews investigated financial	2012	No rating tool available for this type of document	n/a (includes reviews, not single studies)

	incentives targeting patients for immunization uptake, and found mixed results: one reported improved immunization uptake, although a smaller effect than with organizational change interventions; another showed non-significant changes with both financial incentives and with complex health systems interventions including patient financial incentives; and a third showed significant increases compared to no intervention or telephone calls or prompts, but not other interventions. One review also suggested increased medicines adherence or uptake with financial incentives.			
Effectiveness of cash or voucher financial incentives for simple and complex health behaviour change in high-income countries (53)	The findings of this review generally suggested that a financial incentive was more effective than no financial incentive for health behaviour change. The average effect of the financial incentives relative to no intervention or usual care was greater for short-term (<= 6 months) smoking cessation, long-term (>6 months) smoking cessation, vaccination or screening attendance, and all three complex health behaviors combined. There was no convincing evidence to suggest differential effects between groups based on follow-up time or total incentive value for smoking cessation, although analyses suggested some effect of cash-only financial incentives compared to other formats, and increased incentive values. For vaccination or screening attendance, cash plus other motivational components were found to be more effective than cash or vouchers alone; no effects were found for different incentive values. For physical activity, a difference of 16 additional minutes of daily physical activity was observed between financial incentive and control groups. For all behaviours combined, some evidence suggested a decreased effect with increasing post-intervention follow-up and increasing incentive value. Average effect of cash-only financial incentives was greater than for other formats.	2012	9/11 (AMSTAR rating from McMaster Health Forum)	0/16
Effectiveness of financial incentives to achieve sustained changes in smoking, eating, alcohol consumption and physical activity (55)	Overall, the findings of this review suggested that financial incentives were found to increase attainment of target levels of behaviour change, sustained up to 18 months from baseline. Sustained change in overall behaviour with financial incentives was noted up to 2-3 months after incentive removal, but was not maintained thereafter. Behavioural effects were observed to weaken over time. Financial incentives were found to be effective with smoking cessation rates (effects seen for 12-18 months, sustained for two to three months after incentive removal) and healthier eating targets (for six to 12 months, not sustained after incentive removal), but not for physical activity (at six, 12-18 months and three months after incentive removal). High deprivation increased the effect of financial incentives, but only six to 12 months from baseline. Other variables did not independently have a significant modifying effect at any follow-up time-point. This study indicates personal financial incentives may have an effect on individual health-related behaviours, but may not have a sustained effect on disease burden reduction.	2012	8/11 (AMSTAR rating from Program in Policy Decision-Making)	0/34
Effectiveness of financial incentives and contingency management programs on long-term smoking cessation rates (56)	Incentives included lottery tickets, prize draws, cash payments, item vouchers, grocery vouchers, and money deposits. The odds for sustaining smoking cessation at longest follow-up was 1.42 relative to the control group, and only three studies demonstrated significantly higher quit rates in the incentive group compared to the control. In eight of nine trials with data on pregnant smokers, an adjusted odds ratio at longest follow-up (up to 24 weeks post-partum) of 3.60 was reported based on moderate quality studies, favouring incentives. Three trials indicated a clear benefit for contingent rewards; the largest included trial provided intervention quitters up to £400 of vouchers, and found rates of 15.4% versus 4% for the two groups at longest follow-up. Four trials showed that successful quit attempt rewards compared to fixed payments for antenatal appointment attendance resulted in higher quit rates.	2014	10/11	0/21

	The results of the review indicated that incentives may boost cessation rates while in place, with sustained success rates seen only where resources were concentrated into substantial cash payments for abstinence. Incentives for pregnant smokers may improve cessation rates, both at end-of-pregnancy and post-partum assessment stages.			
Effectiveness of financial incentives for encouraging healthy behaviours (54)	Five themes were identified: fair exchange, design and delivery, effectiveness and cost-effectiveness, recipients, and impact on individuals and wider society. Fair exchange is when financial incentives that promote health involve a beneficial exchange between the recipient and incentive provider. There is lack of consensus on whether health-promoting financial incentives (HPFI) are beneficial or fair for the parties involved. There is evidence that the design and delivery of HPFI contributes to perceptions of whether they are acceptable or not. If HPFIs are found to be effective, safe, recipient-focused, and intrusion minimizing, they tend to be more accepted. Concerns raised in reference to appropriate providers of HPFI include that many socio-economically disadvantaged individuals are unwilling to accept federally funded HPFI, and that there is potentially negative impact of HPFI on doctor-patient relationships. Moreover, there is strong consensus that if HPFI is effective and cost-effective, it is more likely to be acceptable. A common criticism of HPFI is that it offers only short-term motivation. There is no consensus on the reason for this. There is some evidence to suggest there are concerns with cash incentives as they may be used to fund behaviours they were designed to prevent. The impact of HPFI on individuals and wider society is that there is evidence to suggest that HPFI can encourage individuals to take responsibility for themselves, however there is also evidence that HPFI may be perceived as paternalistic and undermines an individual's autonomy. Financial incentive programs that benefit recipients and wider society are likely to be considered more acceptable.	2014	6/10 (AMSTAR rating from McMaster's Health Forum Impact Lab)	0/81
Incentives for improving human resource outcomes in healthcare (57)	Thirty-three reviews summarizing the effectiveness of incentives for improving human resources in healthcare (e.g., job satisfaction, turnover rates, recruitment, retention) were identified, of which 13 reviews meeting quality criteria were finally included. Mixed evidence was found for the use of financial incentives: while there may be a positive influence on job satisfaction and healthcare-provider recruitment, there was a lack of evidence supporting such an influence on retention. Higher wages were found to influence job satisfaction and aid recruitment and initial retention, although the effectiveness on retention was found to decline after five years. Financial compensation was also found to not necessarily be the most effective strategy to retain nurses versus other factors such as a positive work environment. While there is a relative lack of evidence to show that financial incentives are important for medical student and physician retention for rural and remote communities, findings suggest that financial compensation, scholarship schemes, benefits and loan repayments may be linked to healthcare-provider recruitment in these areas. The review found that direct compensation through salaries, indirect payment through benefit packages and financial incentives in general were often the first incentives considered, and higher salaries and indirect compensation remained popular, although their effectiveness for key outcomes remained unclear. Mixed results were reported for the effectiveness of non-financial incentives, and incentives emphasizing work-life balance (e.g., child care), and strategies such as those providing opportunities for collaboration were both found to improve job satisfaction and staff retention. While child care supports, social hours, family supports and workload adjustments were found to be effective, they were not always clearly defined in included reviews. Based on the findings of the review, the authors suggested a strategy combining financial and non-financial incentives (e.g., high-quality working environments, opportunities for professional growth) might be more effective on human resource outcome improvements than financial incentives alone.	2012	No rating tool available for this type of document	n/a (includes reviews, not single studies)

Examining the impact of financial incentives on healthcare professional behaviour and patient outcomes (58)	Overall, researchers concluded that payment for service, payment for providing care for a patient or specific population, payment for providing a pre-specified level of care or providing change in activity or quality of care, were effective. Mixed results were obtained for mixed or other system interventions, and payment for working for a specified time period was generally ineffective. Financial incentives were found to be effective in improving processes of care, referrals and admissions, and prescribing costs. They showed mixed effects for consultation or visit rates, and they were found to be generally ineffective in promoting compliance with guidelines. However, these results should be treated with caution due to the low to moderate quality of evidence of the studies included in each review.	2010	No rating tool available for this type of document	n/a (includes reviews, not single studies)
Effectiveness of pay-for-performance schemes targeting individual healthcare providers for improving quality of patient care and patient-relevant outcomes (59)	Uncontrolled studies included in this review indicated that the pay-for-performance scheme improved quality of care, although higher-quality studies did not report similar findings. Interrupted time series studies suggested mixed effects of the scheme, with two not detecting any process of care or clinical outcome improvements, one reporting initially statistically significant improvements in guideline adherence which became minimal over time, and two others reporting statistically significant blood pressure control improvements and hemoglobin A1C control declines. Specific to preventive care, two randomized controlled trials ranked highly by the authors found significant but small effects on vaccination rates, while two other studies found no effect on mammography, and Pap spears and mammography combined. Other studies found mixed results between significant effects on one outcome and no effect on another. Specific to long-term care and chronic conditions, one highly-ranked randomized controlled trial found no differences between treatment and control arms in assessing proportion of patients smoke-free. Additionally, an interrupted time series study reported no findings suggestive of a faster rate of increase in quality scores for incentivized indicators (asthma, diabetes, hypertension, coronary disease) compared to before pay-for-performance implementation, and no improvements in non-incentivized indicators. While pay-for-performance schemes may be useful in identifying elements of care valued within a given healthcare organization, current evidence targeting individual practitioners is insufficient to support its adoption, and its efficacy on quality of care and patient-relevant outcomes remains uncertain.	2012	9/10 (AMSTAR rating from McMaster Health Forum)	1/30
Effectiveness of behaviour change interventions to encourage generic drug prescriptions in the U.K. National Health Service and similar settings (67)	This rapid evidence synthesis included systematic reviews of interventions reporting outcomes relevant to generic drug utilization and related primary studies. Financial incentives (fund holding, drug budgets) were assessed in a review by Sturm et al. (2005) to determine their effects on prescribing policies, specifically on drug use, healthcare utilization, health outcomes and costs. While the review's included studies had serious limitations and careful consideration was noted as being required in interpreting review results, budgeting funds to a group of individual physicians and providing them financial responsibility for their own budget was found to increase generic drug use. Among intervention studies, a primary study was conducted in the United Kingdom with general practitioners at 10 institutions in the Wirral Health Authority from 1992 to 1993, assessing the impact of a financial incentive combined with standard setting for improvement, interactive education, and established cost-saving and clinical audit performance standards. Compared against no intervention, the proportion of generic prescribing increased by 5% in the intervention group, although a high risk of bias was noted for randomization, allocation	2013	No rating tool available for this type of document	0/23

	concealment and potentially for baseline characteristics, and differences began declining after an additional three months. Overall, findings suggest financial incentives with educational interventions and audit/feedback provision may be most effective in encouraging physician generic prescribing, although evidence is generally weak, and practical and cost-related considerations must be considered.			
Effects of financial incentives on the quality of healthcare provided by primary-care physicians (60)	This review focused on studies involving monetary transfer (change in amount, level of method of payment) targeting primary-care physicians, primary-care teams, and addressing quality of care related to patients' health and well-being. Modest and variable effects on quality of healthcare provided by primary-care physicians were reported; while six studies reported statistically significant positive effects with financial incentives, the majority of which were across only one of many quality measures used in the study, and involved significant selection bias and poor study designs. One study found no effect of financial incentives on quality of care. The review's findings suggested that the following characteristics influenced financial incentive effectiveness: amount and method of payment (salary, fee-for-service, performance bonus, payment target (individual or team), timing); the importance of the income relative to other motivators (intrinsic motivation or other extrinsic motivators such as autonomy); opportunity costs of changing behaviour (other priorities for physicians); heterogeneity across physicians; and heterogeneity in marginal costs of changing behaviour (e.g., administration costs). The authors reported evidence was insufficient to either support or oppose financial incentive use to improve primary-care physician service provision quality, and implementation of such incentive schemes and their assessment require careful and rigorous designs.	2009	10/10 (AMSTAR rating from McMaster Health Forum)	0/7
Interventions for supporting nurse retention in rural and remote areas (61)	Five relevant reviews were identified. With regards to financial incentives, one review synthesizing 43 empirical studies targeting nurses and physicians identified five types of programs addressing return of service: service requiring scholarships, educational loans with service requirements, service-option educational loans, loan repayment programs, and direct financial incentives. While the review identified substantial evidence on incentives for return of service as a health policy intervention to attract human health resources to underserved areas, there was limited evidence on rural area retention. Financial incentive programs were found to place substantial numbers of health workers in underserved areas, and participants were more likely to work in underserved areas for long durations relative to non-participants, although they were less likely to remain at their site of original placement. A second systematic review addressing effectiveness of different retention strategies found 14 relevant papers (n=1 on nurse retention, n=6 on medical practitioners, n=5 on healthcare professionals with an emphasis on medical doctors, n=1 on psychiatrists). While financial incentives were the most commonly reported strategy, the review offered limited support for their efficacy, with results indicating they were more effective in improving recruitment and short-term retention than fostering long-term underserved area service retention. Some evidence suggested strategies involving some form of obligation (e.g., visa conditions restricting area of practice or loan repayment) might be effective in longer retention durations. Other evidence indicated non-financial incentives (e.g., providing quality working and housing conditions) might have a greater impact on retention-related decisions. Overall, while financial incentives were the only strategies that had been evaluated properly, evidence supporting their effectiveness on long-term nurse retention was still found to be very limited, with some	2012	No rating tool available for this type of document	n/a (includes reviews, not single studies)

Evidence >> Insight >> Action

	evidence suggesting they lacked effectiveness. Evidence on "direct and indirect financial incentives (direct payments, service-requiring scholarships, educational loans with service requirements, loan repayment programs)" was classified as being moderate-strength and indirect. In comparison, effectiveness of education and continuous professional development interventions (e.g., recruitment from and training in rural areas, targeted admission of students from rural backgrounds) was rated as being based on moderate-strength, indirect evidence. Regulatory interventions (e.g., increased opportunities for recruitment to civil service) were rated as having low-strength, indirect evidence, and personal and professional support interventions (e.g., general rural infrastructure improvement, supportive supervision, and measures to reduce healthcare workers' feelings of isolation) were rated as having a combination of moderate-strength, indirect evidence and strong direct evidence.			
Leaders' experiences and perceptions implementing activity-based funding and pay-for-performance hospital funding models (62)	All of the included studies focused on leaders' experiences with implementing organizational incentives, but none clearly described 'how' funding models were implemented. Five themes were identified based on leaders' experiences: 1) pre-requisites for success; 2) perceived benefits; 3) barriers/challenges; 4) unintended consequences; and 5) leader recommendations. Pre-requisites for success include: full organizational commitment to and support for the chosen funding model; required infrastructure to support the individuals and activities required to accurately measure quality in pay-for-performance models; information technology and decision support systems for producing, tracking and aggregating high-quality, timely, accessible, clinically relevant data; committed leaders who are supportive of the funding model and recognize the benefits that can be achieved; and involving physician leaders to support accurate data collection and to act as 'champions'. Perceived benefits for activity-based funding included improved productivity and efficiency, ability to reallocate funds, supporting greater emphasis on evaluation, accountability and discharge planning, improved data accuracy, improved collaboration and communication. Improved quality and enhanced organizational transparency were associated with pay-for-performance models. Barriers/challenges to implementation included lack of resources (e.g., constrained human resources given additional workload for providers), data collection (e.g., difficulty gathering accurate data and lack of experienced staff for data collection), and commitment factors (e.g., leaders' skepticism or suspicion about the funding model). Unintended consequences included opportunistic behaviour, 'cherry picking' patients with less complex conditions and who are less expensive to treat (possibly leading to the exclusion of more vulnerable patients), and inaccurate reporting and evaluation of quality outcomes. Leader recommendations included the need to have support for the funding model change from different leaders within the organization (including administrators, health professionals and staff) from the beginning of the transition to ensure full engagement during the entire implementation process. Recommendations to support quality improvement at the program/unit level included providing educational resources for hospitals and training programs, increasing collaboration and cooperation with other units and project groups/committees, increasing interprofessional communication and interaction, and sharing data collection personnel, protocols and tools.	2013	8/9 (AMSTAR rating from McMaster Health Forum)	0/14
Effectiveness of pay-for-performance on clinical efficacy, access and	Congruent with previous evidence on the pay-for-performance scheme in primary or acute care settings, the review suggested that clinical effectiveness results from 47 studies suggested a general improvement of 5% in clinical effectiveness was observed. While positive effects were reported in diabetes, asthma and smoking	2009	7/10 (AMSTAR rating from	2/128

equity, coordination and continuity, patient-centredness and cost-effectiveness (66)	cessation, the scheme most frequently failed to affect acute care. Effects on non-incentivized quality measures varied greatly. One study also suggested a potential positive spillover effect as well. Twenty-eight studies supported the notion that the pay-for-performance scheme did not have negative effects on patients belonging to certain age groups, ethnic groups, comorbid statuses or socio-economic statuses. Before-and-after studies without control groups have provided some support for positive effects with coordination of care, although a time-series study suggested no effect and a potential negative spillover effect as well. In terms of patient-centredness, two studies found no effect (potentially due to a ceiling effect), while one found positive effects. Cost-effectiveness of pay-for-performance schemes use was confirmed by four studies, although health gain findings were varied. Findings suggested that purely positive financial rewards generate more positive effects than competition-based incentives with winners and losers. Fixed threshold and continuous scale rewards for target achievements or improvements have both been found to have positive effects in some studies, and no or mixed effects in others. In general, positive effects are clearly larger in initially low performers with significant room for improvement, relative to already high performers. Programs aimed at the individual provider and/or team level(s) generally reported positive results; programs aimed at hospitals generally reported smaller positive effects. While a combination of incentives at different target units was rarely used, two studies reported positive results. As per the findings of this review, future pay-for-performance programs should define targets based on baseline room for improvement, use process and intermediary outcome indicators as target measures, engage stakeholders and communicate information directly, focus on both quality improvement and achievement, and target individuals and teams.		McMaster Health Forum)	
Factors affecting the use of research evidence by policymakers (70)	Efforts to support the use of research evidence generally strive to address the two factors that emerged with some consistency in a systematic review of 124 studies (case studies, interview studies, documentary analyses) of the factors that increased the prospects for research use in management / policy: 1) interactions between researchers and decision-makers (e.g., engaging decision-makers in priority-setting, research (including reviews) and deliberative dialogues); and 2) timing / timeliness (e.g., facilitate retrieval of optimally packaged, high-quality and high-relevance systematic reviews and evidence briefs (e.g., one-stop shopping, rapid response units).	2009	Not available	Not available

Appendix 3: Examples of processes to identify the citizen (or patient) behaviours, clinical practices and/or organizational behaviours that need to change to advance quality in health systems (table reproduced with permission from Ellen ME et al. 2015)(2)

Type of approach	Example	Key features

Systematic/structured	Integrated checklist to identify factors that might prevent or enable improvements in clinical practice (169)	• Developed through a recent medium-quality review.(169)
		• Based on 12 checklists that were identified in the review, an integrated checklist with 57 potential determinants of practice (many of which include theory-based elements) was developed.
		• The determinants of practice were grouped into the following seven domains:
		  o guideline factors (e.g., whether recommendations are based on strong evidence, feasible and appropriate);
		  o individual health professional factors (e.g., knowledge/skills, attitudes and behaviours);
		  o patient factors (e.g., patient needs, beliefs, knowledge, preferences, motivation and behaviour);
		  o professional interactions (e.g., communication and influence, team processes, and referral processes);
		  o incentives and resources (e.g., availability of resources, financial and non-financial incentives and disincentives, information systems, quality and safety monitoring systems, continuing education, and availability of assistance for clinicians);
		  o capacity for organizational change (e.g., mandate, authority, accountability and leadership); and
		  o social, political and legal factors (e.g., economic constraints, contracts, legislation, payer or funder policies, and malpractice liability).
		• In addition to the checklist, five worksheets were developed as part of this review that are designed to support the development of tailored implementation strategies based on the areas identified as warranting targeted implementation efforts.(169)

Iterative/theory-based (i.e., focused on iteratively testing and refining an approach based on an existing theory to ensure it is attuned to the underlying causes of a problem)	The Behaviour Change Wheel (68)	• Developed through a recent medium-quality systematic review of 19 frameworks of behaviour change.(68) • The Behaviour Change Wheel is centred around a "behaviour system" that includes three essential conditions of: 1) capability (i.e., an individual's psychological and physical capacity to engage in a specified activity); 2) opportunity (social and physical factors that lie outside the individual that make a behaviour possible or prompt it); and 3) motivation (cognitive processes that energize and direct behaviour).(68) • These three conditions of the behaviour system provide a basis for identifying underlying causes of a particular problem, and then for designing interventions that address areas where the need for behaviour change has been prioritized. • Encircling this hub are nine groupings of interventions that could be used to address deficits in the three conditions, which are further encircled by seven policy activities that could be used to support the implementation of those interventions (see element 2 for more details about these activities).(68)

	Theoretical Domains Framework (170)	• Developed through an expert consensus process and validation exercise, and offers a process to identify relevant psychological and organizational theory to support clinical behaviour change at the individual level.(170;171)
		• At the stage of identifying what needs to be changed, it is important to specify who needs to do what differently, and assess the barriers and enablers that need to be addressed (i.e., ascertain the causes of the problem).
		• The tasks used for specifying who needs to do what differently include:
		  o identifying gaps between evidence and practice (using explicit criteria and high-quality data and evidence);
		  o identifying the types of behaviours that need to change in order to reduce or eliminate the evidence-to-practice gap; and
		  o specifying the health professional groups that need to change behaviour.(170)

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- Specific groups of tasks involved for ascertaining the cause of the problem can be time-intensive and include selecting theory(ies) and frameworks to identify possible pathways to change, and likely barriers and enablers along the pathway, and then collecting data (quantitative and/or qualitative) to identify barriers and enablers.
- As another complementary framework outlines, causes of the problem could be at one or more of the following five levels:
  1) motivation at the individual level (e.g., how knowledge, beliefs about capabilities and consequences, skills, memory, emotion and goals exert influence);
  2) tasks at the individual or team level (e.g., how work routines and procedures function);
  3) roles at the professional level (e.g., how responsibilities are assigned);
  4) rules at the organizational level (e.g., how authority is allocated); and
  5) strategies (e.g., how resources are allocated) at the system level (e.g., governance, financial and delivery arrangements, which include the financial incentives and complementary policy instruments being discussed here).(172)

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Appendix 4: Table 1: Key features of professional behaviour-change interventions (content for this table has been directly extracted from the summary of interventions presented in Grimshaw et al. 2012 (43) and the table is reproduced from two evidence briefs) (4;173)

Description of candidate strategy/technique (active ingredients)	Causal mechanisms*	Mode of delivery	Intended targets
Printed educational materials (44) • "Distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials and electronic publications" • Commonly used, and relatively low cost and feasible	• Education • Training	• Delivered personally or through mass mailings	• Knowledge and potential skill gaps of individual clinicians • Motivation (when written as a persuasive communication)
Educational meetings (45) • "Participation of healthcare providers in conferences, lectures, workshops or traineeships" • Commonly used, main cost is for the release time for healthcare professionals, and generally feasible	• Education • Training • Persuasion	• Didactic or interactive meetings	• Knowledge (for didactic approach) or knowledge, attitudes and skills (for interactive approach) at the individual healthcare professional/peer group level
Educational outreach (46) • "Use of a trained person who meets with providers in their practice settings to give information with the intent of changing the providers' practice. The information given may have included feedback on the performance of the provider(s)" • Used across a wide range of healthcare settings, especially to target prescribing behaviours, and require considerable resources (including the costs of detailers and preparation of materials) • The detailer will tailor their approach to the characteristics of the individual clinician, and typically use additional provider behaviour-change strategies to reinforce their message	• Education • Training • Persuasion	• The detailer aims to get a maximum of three messages across during a 10- to 15-minute meeting with a clinician	• Knowledge and attitudes through a social-marketing approach (174) • Most studies of educational outreach have focused on changing relatively simple behaviours that are in the control of individual clinicians, such as the choice of drugs to prescribe
Local opinion leaders (47) • "Use of providers nominated by their colleagues as 'educationally influential,' and the investigators must have explicitly stated that their colleagues identified the opinion leaders" • Colleagues identify different opinion leaders for different clinical problems,(175) and opinion leaders were not stable over time (176) • Resources required include the costs of the identification method, training of opinion leaders, and additional service costs • Informal leadership is not a function of the individual's formal position or status in the system; it is earned and maintained by the individual's technical competence, social accessibility, and conformity to the system's norms • As compared to their peers, opinion leaders have greater exposure to all forms of external communication, have somewhat higher social status and are more innovative	• Education • Training • Persuasion	• Opinion leadership is the degree to which an individual is able to influence other individuals' attitudes or overt behaviour informally, in a desired way, and with relative frequency • Opinion leaders have a unique and influential position in their system's communication structure; they are at the centre of interpersonal communication networks	• Knowledge, attitudes and social norms of the opinion leader's peer group, and the potential success is dependent upon the existence of intact social networks within professional communities

Audit and feedback (177;178) • "Any summary of clinical performance of healthcare over a specified period of time" to change health professional behaviour, as indexed by "objectively measured professional practice in a healthcare setting or healthcare outcomes" • The resources required to deliver audit and feedback include data abstraction, analysis and dissemination costs • Feasibility may depend on the availability of meaningful routine administrative data for feedback	• Education • Persuasion • Enablement • Modelling	• Information extracted from medical records, computerized databases, or observations from patients • Summary of performance may include recommendations for clinical action and action planning	• Healthcare provider/peer groups' perceptions of current performance levels • Create cognitive dissonance within healthcare professionals as a stimulus for behaviour change (e.g., Adams and colleagues observed that healthcare professionals often over-estimated their performance by around 20% to 30%) (179)
Reminders (49) • "Patient- or encounter-specific information, provided verbally, on paper or on a computer screen…" • The resources required vary across the delivery mechanism, and there is insufficient knowledge at present about how to prioritize and optimize reminders • The majority of early studies on computerized reminders were undertaken in highly computerized academic health science centres in the United States, and their generalizability to other settings is less certain (180)	• Environmental restructuring	• Provided on paper or on a computer screen (e.g., computer-aided decision support and drugs dosage) • Reminders may be encountered through general education, medical records and/or interactions with peers	• Prompt health professionals to recall information and remind them to perform or avoid some action to aid individual patient care (181)
Tailored interventions (50) • "Strategies to improve professional practice that are planned taking account of prospectively identified barriers to change"	• Dependent on the composition of the tailored strategy	• Dependent on the composition of the tailored strategy	• Professional practice based on prospectively identified barriers to change
Multifaceted interventions (51) • Any intervention including two or more components and that potentially targets different barriers in the system • Multifaceted interventions are likely to be more costly than single interventions, and when planning multifaceted interventions, it is important to carefully consider how components are likely to interact to maximize benefits	• Dependent on the composition of the multifaceted strategy	• Dependent on the composition of the multifaceted strategy • Few studies provide any explicit rationale or theoretical base for the choice of intervention, and it is therefore unclear whether an *a priori* rationale based on possible causal mechanisms or an 'everything but the kitchen sink' approach is used for the choice of components in multifaceted interventions	• Professional practice (potentially based on prospectively identified barriers to change)

* Mechanisms listed in this column are based on those included in the Behaviour Change Wheel (68)

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