



EVIDENCE >> INSIGHT >> ACTION

Evidence Brief:
Using Financial Incentives to Achieve Health-System Goals in Ontario

16 September 2015

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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Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the evidence brief. The funders played no role in the identification, selection, assessment, synthesis, or presentation of the research evidence profiled in the evidence brief.

Merit review

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

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Table of Contents

KEY MESSAGES.....5

REPORT.....7

THE PROBLEM..... 11

 Ontario continues to set health-system goals that can be a struggle to achieve 11

 Historically, Ontario has sometimes used targeted financial incentives to achieve health-system goals, with variable results 12

 These variable results may be explained by how financial incentives have been designed (and complemented by other policy instruments), monitored and updated..... 19

 Additional equity-related observations about the problem 21

THREE POTENTIAL ELEMENTS OF AN APPROACH TO ADDRESSING THE PROBLEM..... 22

 Element 1: Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals 23

 Element 2: Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals 26

 Element 3: Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals 36

 Additional equity-related observations about the three options..... 38

IMPLEMENTATION CONSIDERATIONS 39

REFERENCES..... 41

APPENDICES..... 47

KEY MESSAGES

What's the problem?

- Ontario continues to set health-system goals that can be a struggle to achieve;
- Historically, Ontario has sometimes used targeted financial incentives to achieve health-system goals, with variable results; and
- these variable results may be explained by how financial incentives have been designed (and complemented by other policy instruments), monitored and updated.

What do we know from systematic reviews about three viable elements of an approach to address the problem?

- Element 1 – Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals
 - Important components of this element include: identifying the behaviours to be changed; specifying who needs to do what differently; ascertaining the causes of the problem; engaging key stakeholders; and iteratively refining the understanding of the problem and the level at which it can most helpfully be considered.
 - We found systematic/structured approaches for identifying the specifics of any health-system goals to be achieved (e.g., conducting systematic reviews and/or using checklists), and theory-based approaches for identifying the underlying challenges in achieving these goals (e.g., the Behaviour Change Wheel and the Theoretical Domains Framework).
- Element 2 – Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals
 - Seven overviews of systematic reviews and nine systematic reviews that complement these overviews found that financial incentives targeting citizens, health professionals, organizations and both health professionals and organizations can be effective in supporting the achievement of health-system goals, but that the effects are either modest or variable.
 - Several high-quality reviews found beneficial effects on achieving health-system goals for educational materials, educational meetings, educational outreach visits, local opinion leaders, audit and feedback, computerized reminders, and tailored interventions.
 - The effect sizes found for each of these interventions have large variability, which reinforces the importance of diagnosing the underlying cause of the problem and then, based on the diagnosis, selecting from the array of candidate policy instruments, combining them in a way that maximizes their effectiveness, and iteratively refining and tailoring them to ensure they continue to achieve health-system goals.
- Element 3 – Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals.
 - We found three systematic reviews that outlined beneficial effects of quality-improvement strategies, which could be useful for this element given the focus of these approaches on using a formalized and systematic approach to assessing performance and making any necessary changes to achieve goals.
 - Activities related to this element could also be guided by the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework.

What implementation considerations need to be kept in mind?

- While potential barriers exist at the levels of providers, organizations and systems, one significant barrier lies in shifting to a more dynamic approach to financial incentives, which involves more rigorous monitoring and evaluation and more time-limited uses of financial incentives.
- On the other hand, a number of potential windows of opportunity could be capitalized upon, which include a growing focus on achieving health-system goals and a willingness to learn from past experience.

REPORT

This is the second of two ‘sister’ evidence briefs, the first of which addressed optimizing clinical practice in Ontario based on data, evidence and guidelines.⁽¹⁾ While the first of the two evidence briefs acknowledged the potential importance of financial incentives, it did not give them much attention.

Ontario uses a wide variety of financial incentives and the time is ripe to stand back and ask whether they are being used optimally to achieve health-system goals, and where – for which types of stakeholders, in what sectors and for which types of conditions – does additional effort need to be put into their design, execution and monitoring. Additional background about the process of preparing the brief is provided in Box 1.

Any form of financial arrangement will create a financial incentive of some form or other. The Ontario health system’s financing, funding and remuneration mechanisms do this every day.

Financing mechanisms (i.e., how we raise revenue to pay for health services) in Ontario can create incentives for the citizens and corporations who pay tax (e.g., income tax, HST), the citizens and employers who pay insurance premiums (e.g., Ontario Health Premium, private insurance premiums), the citizens and employers who pay into health savings accounts, and the citizens who pay out-of-pocket for care (e.g., deductibles and cost sharing).

Funding mechanisms (i.e., how we pay health organizations) also create incentives. In Ontario, these mechanisms include global budgets (i.e., the traditional approach to funding hospitals), prospective payment (e.g., Ontario’s Quality Based Procedures), fee-for-service, and a hybrid approach (e.g., Ontario’s Health Based Allocation Model, which is based on a complex mix of demographics and the complexity and types of care being provided). Quality Based Procedures were introduced in 2012/13 and have grown each year as a percentage of hospital budgets (6% at baseline, 15% in 2013/14, and 30% in 2014/15). The Health Based Allocation Model was introduced in 2011/12 and accounted for only 1.5% of hospital budgets at baseline, but rose to 40% the following year.

Box 1: Background to the evidence brief

This evidence brief mobilizes both global and local research evidence about a problem, three potential elements of an approach to addressing the problem, and key implementation considerations. Whenever possible, the evidence brief 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 evidence brief does not contain recommendations, which would have required the authors of the brief to make judgments based on their personal values and preferences, and which could preempt important deliberations about whose values and preferences matter in making such judgments.

The preparation of the evidence brief involved five steps:

- 1) convening a Steering Committee comprised of representatives from the partner organizations, key stakeholder groups, and the McMaster Health Forum;
- 2) developing and refining the terms of reference for an evidence brief, particularly the framing of the problem and three potential elements of an approach for addressing it, in consultation with the Steering Committee and 18 key informants, and with the aid of several conceptual frameworks that organize thinking about ways to approach the issue;
- 3) identifying, selecting, appraising and synthesizing relevant research evidence about the problem, approach elements, and implementation considerations;
- 4) drafting the evidence brief in such a way as to present concisely and in accessible language the global and local research evidence; and
- 5) finalizing the evidence brief based on the input of several merit reviewers.

The three potential elements of an approach could be supplemented or replaced by other elements or given greater or lesser attention relative to each other.

The evidence brief was prepared to inform a stakeholder dialogue at which research evidence is one of many considerations. Participants’ views and experiences and the tacit knowledge they bring to the issues at hand are also important inputs to the dialogue. One goal of the stakeholder dialogue is to spark insights – insights that can only come about when all of those who will be involved in or affected by future decisions about the issue can work through it together. A second goal of the stakeholder dialogue is to generate action by those who participate in the dialogue, and by those who review the dialogue summary and the video interviews with dialogue participants.

An evaluation of hospital funding mechanisms (or more specifically an evaluation of hospital funding reform focusing on the hospital corporation as the unit of analysis) is currently addressing three questions:

- 1) was the introduction of reform associated with improvements in measures of care access (number of admissions, both overall and urgent versus elective), quality (re-admissions rates and emergency-department visits within 48 hours for selected case-mix groups), efficiency (length of stay, alternative-levels-of-care (ALC) days, ALC days as a percentage of all days) and integration (percent of patients discharged to home care, percent of patients seen by a physician within seven and 30 days)?
- 2) did the magnitude of improvement vary according to patient age (18-64, 65+), LHIN of residence, treatment category (medical, surgical and potentially Quality Based Procedure), or hospital type (small, large community and teaching)?
- 3) was the introduction of reform associated with readily measureable unintended consequences, such as completeness of case coding?

An evaluation covering the period Q1 2007 to Q1 2014 will be completed by November 2015, and an extension of the analysis to Q1 2015 will be completed by January 2016.

Remuneration mechanisms (i.e., how we pay health professionals) create incentives as well. In Ontario, these mechanisms can range from salary (e.g., physicians working in Community Health Centres and nurses working in many types of health organizations) to capitation (e.g., physicians working in Family Health Networks, Family Health Organizations and some Family Health Teams) to fee-for-service (e.g., physicians working in traditional solo practices).

However, this evidence brief focuses on a more specific use of **financial incentives**, namely **as targeted payments or penalties that seek to achieve particular health-system goals and that are layered on top of or operate alongside existing financing, funding and remuneration mechanisms**. An example of a financial incentive layered on top of an existing remuneration mechanism for physicians would be Ontario's preventive care bonuses, which reward physicians for achieving target proportions of their eligible patients who have been given the flu shot, their immunizations, a Pap smear, a mammogram, and cervical cancer screening.⁽²⁾ An example of a financial incentive operating alongside an existing financing mechanism in some Latin American countries would be the cash payment made to mothers who have their children immunized.

Financial incentives can go by many names, including targeted (or special) payments or penalties (i.e., the terms used in our definition), incentives (or disincentives), pay for performance (or results), premiums (for health professionals), or conditional cash transfers (for citizens, including the Latin American mothers described above). Such financial incentives are typically distinct from traditional financing, funding and remuneration mechanisms, although designing and evaluating targeted financial incentives requires a good understanding of the incentives created by existing financial arrangements.

As these comments suggest, the potential **targets** of financial incentives can range from citizens to health professionals and health organizations. For citizens, the target response is typically to engage in healthy behaviours, effective self-management or appropriate care seeking. For health professionals, the target response can be to practice optimally or, more generally, to perform in ways that align with health-system goals (such as in interdisciplinary teams). For health organizations, the target response can similarly be to perform optimally or, more generally, to perform in ways that align with health-system goals (e.g., to achieve triple-aim objectives⁽³⁾ and their Ontario equivalent, which is often framed as access, quality, health outcomes, and value for money). In Ontario we see many examples of financial incentives targeted at health professionals and organizations, but none intentionally targeting citizens. Although charges for prescription drugs can be seen as a financial (dis)incentive, related reductions in drug use are typically seen – at least with the current government in Ontario – as an unfortunate consequence and not a health-system goal per se (and the recent high-level meeting about the need to launch a national pharmacare program affirmed this view).

Financial incentives can be applied in any **sector** of the health system, from home and community care and primary care to acute, rehabilitation and long-term care and public health. However, in Ontario the most visible uses of financial incentives have been in primary and acute care. Also, at least one sector – long-term care – operates under such finely specified legislation that operators have less latitude to use alternative paths to achieve health-system goals, and hence to use financial incentives to reward some paths over others.

Financial incentives can also focus on any type of health **condition**, from maternal and newborn care, and other examples of ‘wellness’ care (e.g., well-baby visits), to chronic diseases (e.g., cancer, cardiovascular disease and diabetes) and mental health and addictions. In Ontario, financial incentives have most commonly focused on chronic diseases or had no specific focus on a condition.

While what’s known – based on the best available synthesized research evidence – about the desirable and undesirable features of financial incentives will be addressed explicitly later in the evidence brief, it’s important to foreshadow now some of the potential benefits and unanticipated consequences of financial incentives, which are drawn from a companion policy paper.⁽⁴⁾ The potential **benefits** can relate to the particular behaviour or outcome being targeted (e.g., improved quality or efficiency) or to broader impacts (e.g., more explicit priority setting and greater use of electronic health records). The potential **unintended consequences**, on the other hand, can relate to ‘gaming’ and a range of other behaviours that can be counter-productive at the level of citizens (e.g., use of unvalued services), health professionals (e.g., tunnel vision), health organizations (e.g., conflict among clinicians or clinical groups) or health systems (e.g., reduced collaboration). Like all financial incentives, even quality-focused financial incentives can have unintended consequences, such as prioritizing some quality-related activities at the expense of others and engaging in ‘tick-box medicine.’

Financial incentives can also have equity and broader ethical implications. **Equity implications** can be felt at the citizen level (e.g., penalizing vulnerable groups who have limited resources or capacity) and at the professional, organizational and system levels (e.g., inadvertently encouraging the prioritization of patients who are the easiest to serve over those with the greatest need). **Broader ethical implications** can be experienced at the citizen level (e.g., lacking the capacity to understand they are being influenced, viewing the influence as a form of manipulation, effectively forcing

Box 2: Equity considerations

A problem may disproportionately affect some groups in society. The benefits, harms and costs of elements of an approach to address the problem may vary across groups. Implementation considerations may also vary across groups.

One way to identify groups warranting particular attention is to use “PROGRESS,” which is an acronym formed by the first letters of the following eight ways that can be used to describe groups[†]:

- place of residence (e.g., rural and remote populations);
- race/ethnicity/culture (e.g., First Nations and Inuit populations, immigrant populations and linguistic minority populations);
- occupation or labour-market experiences more generally (e.g., those in “precarious work” arrangements);
- gender;
- religion;
- educational level (e.g., health literacy);
- socio-economic status (e.g., economically disadvantaged populations); and
- social capital/social exclusion.

The evidence brief strives to address all Ontarians, but (where possible) it also gives particular attention to both: 1) health organizations and health professionals working with high-needs patients (e.g., poor, socially isolated individuals living with multimorbidity); and 2) at-risk citizens (including, for example, low-income citizens, new immigrants, and First Nations peoples). Many other groups warrant serious consideration as well, and a similar approach could be adopted for any of them.

[†] The PROGRESS framework was developed by Tim Evans and Hilary Brown (Evans T, Brown H. Road traffic crashes: operationalizing equity in the context of health sector reform. *Injury Control and Safety Promotion* 2003;10(1-2): 11–12). It is being tested by the Cochrane Collaboration Health Equity Field as a means of evaluating the impact of interventions on health equity.

them – with relatively large incentives that are ‘too big to say no to’ – to act in particular ways, and feeling that their clinician is no longer acting in their best interest), clinical level (e.g., feeling that they can no longer act in the best interest of their patient) and at the organizational and system levels (e.g., feeling that the administrative burden, including reporting requirements, distracts attention from other activities that could yield bigger impacts).

The **scope** for this evidence brief is targeted financial incentives that are layered on top of or operate alongside existing financing, funding and remuneration mechanisms and that are one of many (complementary) policy instruments to achieve health-system goals. What’s out of scope includes financing, funding and remuneration mechanisms in general, as well as financial incentives that seek to achieve goals beyond the health system (e.g., community-level incentives related to the broader social determinants of health).

This evidence brief gives particular attention to **two groups**: 1) at-risk citizens (including, for example, low-income citizens, new immigrants, and First Nations peoples); and 2) health professionals and organizations working with high-needs patients (e.g., poor, socially isolated individuals living with multimorbidity) (Box 2). For the first group, financial incentives can: a) be viewed as a form of manipulation (removing their capacity for choice); b) if large enough (e.g., a significant financial penalty), effectively force them to act in particular ways; and c) lead them to be de-prioritized because they are less easy to care for. For the second group, financial incentives can: a) encourage the prioritization of individuals who are easier to serve over individuals with the greatest need; b) encourage the prioritization of some quality-related activities at the expense of others; and c) leave managers and health professionals feeling that they can no longer act in the best interest of their patients (and leave patients feeling that their clinicians are no longer acting in their best interest). If efforts to use financial incentives to achieve health-system goals aren’t working or won’t work for one or both of these groups, who can be considered to be the ‘canaries in the coal mine’ for financial-incentive schemes, then new approaches may be needed, at least for these groups.

THE PROBLEM

Three themes can be used to describe where we stand in Ontario with regard to the use of financial incentives to achieve health-system goals:

- 1) Ontario continues to set health-system goals that can be a struggle to achieve;
- 2) historically, Ontario has sometimes used targeted financial incentives to achieve health-system goals, with variable results; and
- 3) these variable results may be explained by how financial incentives have been designed (and complemented by other policy instruments), monitored and updated.

Each of these themes is addressed below in turn. The themes were derived both from the available research evidence (Box 3) and from key-informant interviews.

Box 3: Mobilizing research evidence about the problem

The available research evidence about the problem was sought from a range of published and “grey” research literature sources. The term ‘financial incentive’ was used in all searches, as well as the synonyms listed on page 8. Published literature that provided a comparative dimension to an understanding of the problem was sought using three health services research “hedgies” in MedLine, namely those for appropriateness, processes and outcomes of care (which increase the chances of us identifying administrative database studies and community surveys). Published literature that provided insights into alternative ways of framing the problem was sought using a fourth hedge in MedLine, namely the one for qualitative research. Grey literature was sought by reviewing the websites of a number of Ontario organizations, such as Health Quality Ontario and the Ontario Ministry of Health and Long-Term Care.

Priority was given to research evidence that was published more recently, that was locally applicable (in the sense of having been conducted in Ontario or, failing that, in Canada), and that took equity considerations into account.

Ontario continues to set health-system goals that can be a struggle to achieve

The history of goal setting in Ontario’s health system is a long one. Reducing wait times for diagnostic tests and surgical procedures, for example, was a sustained focus for some time.(5)

Currently the most visible set of goals for Ontario’s health system is captured in ‘Patients First: Action Plan for Health Care,(6) which includes four goals:

- 1) improve access (i.e., provide faster access to the right care);
- 2) connect services (i.e., deliver better coordinated and integrated care in the community, closer to home);
- 3) support people and patients (i.e., provide the education, information and transparency needed to make the right decisions about their health); and
- 4) protect the universal public healthcare system (i.e., make decisions based on value and quality, to sustain the system for future generations).

But there are many additional goals at the sectoral level and in other domains. For example, the goals for Ontario’s home and community care sector are captured in ‘Patients First: A Roadmap to Strengthen Home and Community Care,’(7) which includes five goals:

- 1) put clients and caregivers first;
- 2) improve client and caregiver experience;
- 3) drive greater quality, consistency and transparency;
- 4) plan for and expand capacity; and
- 5) modernize delivery.

Achieving such goals can be a struggle, and sustaining these achievements can be an even greater struggle. The government of Ontario can draw on many policy instruments to help achieve and sustain the goals it sets for the Ontario health system. Financial incentives are just one of them.

Historically, Ontario has sometimes used targeted financial incentives to achieve health-system goals, with variable results

Examples of Ontario's use of financial incentives are presented in Table 1. These examples were selected based on their citation in key-informant interviews. The notable features of these examples include:

- 1) some were put in place as long as a decade and a half ago;
- 2) their targets include a range of health professionals (primarily physicians and only occasionally at the practice, as opposed to the individual, physician level) and hospital executives, but not citizens;
- 3) the involved sectors are typically primary and acute care;
- 4) the applicable conditions are typically chronic diseases (e.g., cancer, diabetes), a risk factor for chronic diseases (smoking) or preventable infectious diseases;
- 5) all are framed as individually targeted bonuses, and not as organizationally targeted or as penalties (although the incentive for senior hospital executives can be seen as a penalty applied to compensation that would have been given otherwise);
- 6) all use performance measures based on thresholds;
- 7) none apply change-based thresholds (e.g., 20% increase over baseline level) or tournament standards (e.g., top 20% of relevant group) and, of those applying an absolute threshold, one uses proportions (e.g., 75% of patients, again for the set of incentives for primary care physicians), one is individually negotiated on an organization-by-organization basis (i.e., senior hospital executive compensation) and the rest function effectively as a fee-for-service payment or as a lump-sum payment for full adherence;
- 8) incentive sizes are difficult to describe in relative terms (i.e., compared to total income), but many are modest and some have the potential to be significant;
- 9) payment frequency is typically either in relation to claims submitted or annual, with the exception of the recruitment grants which are quarterly and, in the case of the physician-recruitment grants, higher in the first and last years of the grant (to encourage both initial recruitment and staying for the full four years of the grant); and
- 10) communication strategies, monitoring and updating, and complementary policy instruments are all very difficult to document retrospectively, and the one documented case of a monitoring and updating provision (to ensure that senior hospital executives are not consistently receiving the full bonus) was phrased as being encouraged, not mandated.

Other financial incentives have been used (e.g., paying hospitals to reduce their emergency departments' lengths of stay) but were not cited as frequently by key informants.(8;9)

In its use of financial incentives over the past decade, Ontario has experienced variable results (Table 2). We identified evaluations for four of the financial incentives described in Table 1. The key findings from the evaluations of the effects of financial incentives include:

- 1) modest absolute increase in the provision of four of five preventive services and three recommended diabetes assessments, but with patient, physician and practice characteristics (e.g., patient mental illness, physician age and practice size, respectively), as well as baseline performance, affecting the results; and
- 2) large relative increase in the planned management of diabetes (i.e., maintaining a diabetes flow sheet) among physicians in a blended capitation model (for whom the incentive paid \$33.77 more than a regular visit), compared to those in an enhanced fee-for-service model (for whom the incentive paid only \$4.65 more than a regular visit), and in the use of laparoscopic techniques among surgeons performing colon cancer surgery (for which an incentive was provided) compared to rectal cancer surgery (for which no incentive was provided).

The descriptive evaluation of the financial incentive for senior hospital executives found:

- 1) tremendous variability in the type, number and weighting of targets for and in the percentage of salary affected; and
- 2) a range of implementation challenges, including identifying appropriate targets (with some set below existing performance levels), a simultaneous two-year salary freeze for non-unionized employees, and salary compression in some (particularly smaller) hospitals.

Two points bear noting:

- 1) the implementation or effects of financial incentives were significantly influenced by a variety of other factors at the level of citizens, health professionals, health organizations, and the health system; and
- 2) the effect sizes were never compared to the effect sizes seen with other interventions that can be used to achieve health-system goals (e.g., audit and feedback), and were never assessed in terms of their cost-effectiveness.

Table 1: Financial incentives used in the past decade to achieve health-system goals in Ontario

Key features of the incentives	Examples of incentives						
	Financial incentive for community pharmacists to support smoking cessation among Ontario Drug Benefit (ODB) recipients (10)	Financial incentives for primary-care physicians to provide flu shots for seniors, toddler immunizations, Pap smears, mammograms, and colorectal cancer screening (2;11)	Financial incentives for primary-care physicians to engage in: a) diabetes assessment and b) diabetes management (12-14)	Financial incentive to encourage surgeons to use laparoscopic techniques for colon surgery (15)	Financial incentives to support the recruitment (16) and retention (17) of physicians in rural and northern Ontario	Financial incentive to encourage allied health professionals to practice in northern Ontario (18)	Financial incentive for senior hospital executives to achieve performance-improvement targets (19)
Year (month) initiated	2011 (September)	2006 (April)	2002 (April) and 2006 (April), respectively	2005 (October)	2000 (April)	No date identified	2011 (April)
Target of the incentives	Health professionals (pharmacists)	Health professionals (primary care physicians), although in some instances the incentive can be paid to the practice (e.g., Family Health Networks) (20)	Health professionals (primary care physicians)	Health professionals (surgeons)	Health professionals (primary care and specialist physicians)	Health professionals (audiologists, chiropodists, occupational therapists, physiotherapists, and speech-language pathologists)	Health organizations (hospital CEOs and their direct reports)
Sector in which the incentives are applied	Home and community care; primary care	Primary care	Primary care	Acute (secondary and tertiary) care	Primary and acute care	Many	Acute care
Conditions to which the incentives are applied	Smoking	Cancers (breast, cervical and colorectal) and infectious diseases	Diabetes	Colon cancer and other conditions requiring colon surgery	Not applicable	Not applicable	Variable
Additional features of their design	Pharmacists paid for ODB recipients only	Physicians paid based on the proportion of eligible, rostered patients receiving a prioritized service during a period of time	Physicians paid to: a) maintain a diabetes flow sheet documenting three monitoring tests (HbA1c test, cholesterol test, and retinal eye exam), plus blood pressure, weight, body mass index and medication	Surgeons paid a premium if they use laparoscopic techniques	Physicians provided a grant for establishing and maintaining for four years a full-time practice in a rural or northern community Physicians who have practised for more than four years in a northern community provided an	Allied health professionals provided a grant for accepting a position or establishing a practice in a northern community	Senior hospital executive compensation adjusted based on the achievement of targets

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			dosage; and b) provide a range of guideline-recommended services		annual lump-sum payment		
Framing (e.g., bonus versus penalty, individual versus organizational)	Individual bonus (paid directly to pharmacists)	Individual bonus (paid directly to physicians)	Individual bonus (paid directly to physicians)	Individual bonus (paid directly to surgeons)	Individual bonus (paid directly to physicians)	Individual bonus (paid directly to health professionals)	Individual bonus/penalty (for senior executives)
Performance measures (i.e., the outcome by which performance is measured) (e.g., proportion of eligible patients who received a flu shot in the year)	Number of readiness assessments (first consultations) and follow-up counselling sessions (which makes it more like a fee-for-service payment added alongside the regular remuneration mechanism)	Proportion of eligible patients who received flu shots, immunizations, Pap smears, mammograms, and colorectal cancer screening	Number of visits where the flow sheet was maintained (which makes it more like a fee-for-service payment added alongside the regular remuneration mechanism) Number of patients being provided recommended services	Number of colon surgeries performed using laparoscopic techniques	Starting and maintaining a full-time practice, including hospital privileges if applicable Maintaining a full-time practice, including hospital privileges if applicable	Starting and maintaining a full-time practice/position	Achieving targets agreed on between the CEO and the board to support the implementation of the hospital's quality-improvement plan
Performance standard (e.g., absolute/threshold, change-based or tournament)	Absolute standard: assessment and number of sessions	Absolute standard: 15%-95% and 3-6 standards depending on the service	Absolute standard: number of visits or patients	Absolute standard: number of surgeries	Absolute standard: full-time practice in an eligible community	Absolute standard: full-time practice/position in an eligible community	Absolute standard: individually negotiated based on any type, number and weighting of targets

Using Financial Incentives to Achieve Health-System Goals in Ontario

Key features of the incentives	Examples of incentives						
	Financial incentive for community pharmacists to support smoking cessation among Ontario Drug Benefit (ODB) recipients (10)	Financial incentives for primary-care physicians to provide flu shots for seniors, toddler immunizations, Pap smears, mammograms, and colorectal cancer screening (2;11)	Financial incentives for primary-care physicians to engage in: a) diabetes assessment and b) diabetes management (12-14)	Financial incentive to encourage surgeons to use laparoscopic techniques for colon surgery (15)	Financial incentives to support the recruitment (16) and retention (17) of physicians in rural and northern Ontario	Financial incentive to encourage allied health professionals to practice in northern Ontario (18)	Financial incentive for senior hospital executives to achieve performance-improvement targets (19)
Incentive size	Maximum of \$125/ patient; \$40 for first consultation, once/year only; \$15 for primary follow-ups, three/year; \$10 for secondary follow-ups, four/year	Maximum of \$12,800/ physician (if s/he achieved the highest absolute standard across all prioritized services)	Maximum of \$111/year in 2002/3; \$37/visit for a maximum of three visits/year \$60/rostered patient/year (2006-9) and \$75/patient/year (2009-present)	25% premium on digestive system surgical procedures	Recruitment grants range from \$80,000 to \$117,600/ physician depending on how rural or northern the community being served is Retention incentive is \$7,000/physician/ year	Maximum of \$15,000/three years; \$5,000 per eligible year	No fixed percentage of salary (and while 5 to 15% is noted as 'best practice,' the average was 4% in 2011/12) (21)
Payment frequency	At claim submission (which in turn is after documentation is completed and pharmacist is made aware of program quit status, and which is capped at one/patient/year)	Annually	At claim submission (three/patient/year) At claim submission (one/patient/year)	At claim submission (for any digestive system surgical procedures)	Recruitment grants paid in quarterly instalments, with 40% paid in first year, 15% in second, 15% in third, and 30% in fourth) Retention incentive is paid annually	Recruitment grants paid in quarterly instalments, (for a maximum of three years)	Annually
Communication strategy	MOHLTC website No documentation of other approaches identified	MOHLTC website No documentation of other approaches identified	MOHLTC website No documentation of other approaches identified	MOHLTC website MOHLTC Bulletin (update to implementation of the 2004 Physician Services Agreement)	MOHLTC website No documentation of other approaches identified	MOHLTC website No documentation of other approaches identified	MOHLTC website No documentation of other approaches identified

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Key features of the incentives	Examples of incentives						
	Financial incentive for community pharmacists to support smoking cessation among Ontario Drug Benefit (ODB) recipients (10)	Financial incentives for primary-care physicians to provide flu shots for seniors, toddler immunizations, Pap smears, mammograms, and colorectal cancer screening (2;11)	Financial incentives for primary-care physicians to engage in: a) diabetes assessment and b) diabetes management (12-14)	Financial incentive to encourage surgeons to use laparoscopic techniques for colon surgery (15)	Financial incentives to support the recruitment (16) and retention (17) of physicians in rural and northern Ontario	Financial incentive to encourage allied health professionals to practice in northern Ontario (18)	Financial incentive for senior hospital executives to achieve performance-improvement targets (19)
Monitoring and updating	No documentation of monitoring and update plans identified	No documentation of monitoring and update plans identified	No documentation of monitoring and update plans identified	No documentation of monitoring and update plans identified	No documentation of monitoring and update plans identified	No documentation of monitoring and update plans identified	Organizations encouraged to monitor the incentive and adjust it if, for example, senior hospital executives are consistently receiving the full bonus (21)
Policy instruments used to complement them	Smoke Free Ontario Strategy	Province-wide media campaign for colorectal cancer screening	No documentation of other policy instruments identified	Physician Services Agreement (2004)	Physician Services Agreement (2000)	No documentation of other policy instruments identified	Excellent Care for All Act (2010)

Table 2: Findings from evaluations of financial incentives used in Ontario’s health system

Incentives	Findings from evaluations of the incentives
Financial incentives for primary-care physicians to provide flu shots for seniors, toddler immunizations, Pap smears, mammograms, and colorectal cancer screening (22)*	<ul style="list-style-type: none"> • Modest absolute increase in the provision of four of five preventive services, namely flu shots (2.8%), Pap smears (4.1%), mammograms (1.8%), and colorectal cancer screening (8.5%) • Effect sizes varied by physician age (with younger physicians being more responsive to the Pap smear, mammogram and colorectal cancer screening incentives), practice size (with large practices being more responsive to the mammogram incentive), and baseline performance (with physicians having the lowest baseline performance being the most responsive to the mammogram incentive)
Financial incentive for primary-care physicians to engage in diabetes assessment (13)	<ul style="list-style-type: none"> • Modest absolute increase (from 16% in 2000 to 27% in 2008, or 11 percentage points over an eight-year period) in the proportion of diabetes patients receiving recommended diabetes assessments – four HbA_{1c} tests, two cholesterol tests and a retinal eye exam – over a two-year time period, with individuals with a mental illness (among other characteristics) less likely to receive the tests
Financial incentive for primary-care physicians to engage in diabetes management (12)	<ul style="list-style-type: none"> • Large relative increase (12%) in the planned management of diabetes – as measured by claims for the diabetes management incentive – among physicians in a blended capitation model (Family Health Organizations or FHO) compared to those in an enhanced fee-for-service model (Family Health Groups or FHG), and a smaller relative increase (8%) in the planned management of diabetes – as measured by the proportion of diabetic patients for which the diabetes management incentive was claimed – among FHO physicians compared to FHG physicians
Financial incentive to encourage surgeons to use laparoscopic techniques for colon (but not rectal) surgery (23)	<ul style="list-style-type: none"> • Large relative increase in the annual rate of laparoscopic colon cancer surgery (from 8.7% to 38.9%) compared to the annual rate of laparoscopic rectal cancer surgery (from 4.8% to 19.6%), with the greatest increase in laparoscopic colon surgery occurring shortly after the introduction of the incentive • Increased rates of laparoscopic surgery were associated with a minor decrease in hospital length of stay, but no changes were observed in 30-day mortality, cancer-specific survival or overall survival rates
Financial incentive for senior hospital executives to achieve performance-improvement targets (24)	<ul style="list-style-type: none"> • Significant absolute increase (from 30% to 100%) in the proportion of Ontario hospitals using some sort of pay-for-performance scheme for senior executives as a result of the legislation, however, the schemes currently in use demonstrate tremendous variability in the type, number and weighting of targets and in the percentage of salary affected (with CEO performance incentives ranging from 2% to less than 10% of base pay for most CEOs, but some teaching hospital CEOs facing incentives as high as 30%) • Implementation challenges included identifying appropriate targets (with some set below existing performance levels), a simultaneous two-year salary freeze for non-unionized employees, and salary compression in some (particularly smaller) hospitals (and these challenges sometimes made it difficult to attract qualified senior managers) • While the evaluation panel supported pay for performance, it concluded that the lack of a strategic and consistent approach across hospitals, alongside the salary freeze and salary compression, had undermined the intended outcome of the scheme

*A more targeted but less complex analysis of the effects of the financial incentives on the three preventive services related to cancer screening has also been conducted but not reported here.(25)

These variable results may be explained by how financial incentives have been designed (and complemented by other policy instruments), monitored and updated

The variable results achieved with the use of financial incentives in Ontario may be explained in part by how financial incentives have been designed, monitored and updated (although this hasn't been explicitly tested). In terms of design, the financial incentives were framed as individually targeted bonuses and not as organizationally targeted bonuses or as penalties (with one possible exception), used numbers of patients as measures and not proportions of eligible patients when changing the care provided to patients (with one exception), used an absolute/threshold performance standard and not a change-based or tournament standard, and established no target proportion of income to be 'in play'. Also, the financial incentives for health professionals were typically designed as a one-size-fits-all approach to achieve key health-system goals, including:

- 1) engaging pharmacists in proactively supporting tobacco cessation, primary-care physicians in proactively providing preventive services and in taking a planned and proactive approach to diabetes assessment and management, and surgeons in using (then new) laparoscopic techniques;
- 2) recruiting and retaining health professionals in underserved communities; and
- 3) achieving performance-improvement targets in hospitals.

Yet as we noted in the previous section, the implementation or effects of the incentives were significantly influenced by a variety of other factors at the level of citizens, health professionals, health organizations, and the health system. The monitoring and updating of the financial incentives are much more difficult to assess (as are the communication strategies that should have been part of their design). As we noted in Table 1, monitoring and updating are hard to document retrospectively, and the one documented case of a monitoring and updating provision was phrased as being encouraged, not mandated.

The variable results may also be explained in part by whether and how financial incentives were complemented by other policy instruments. Ontario has used a variety of these other policy instruments to establish health-system arrangements that can support the achievement of health-system goals (Table 3). This can be a blessing, by providing an opportunity for multiple reinforcing supports, as well as a curse, for the several reasons we noted in the 'sister' evidence brief:

- 1) a single health professional or health organization may face both a financial incentive and a variety of other health-system arrangements that can conflict with the incentive and with one another;
- 2) not all of the broader health-system arrangements have been shown to achieve the goals set for them (e.g., a recent systematic review about payment to facilities for episodes of care – the closest match to which we have in Ontario being Quality Based Procedures – found no consistent, systematic differences in mortality rates and volume of care when compared to traditional funding mechanisms);⁽²⁶⁾ and
- 3) some potentially helpful arrangements have not yet been established (e.g., Ontario has no standards for minimum practice size in Ontario and only a small number of standards for organization size, such as volume standards for some cancer surgeries – to make it possible to have dedicated staff and supports operating at appropriate scale for goal achievement – and no standards for some of the work undertaken by LHINs -- to make goal achievement efficient for large organizations whose work crosses LHIN boundaries).

Some of the variability may also be explained by whether health organizations (e.g., primary healthcare practices) employ dedicated staff or hire for-profit firms (who take a share of any incentives) to achieve the requirements of any incentive.⁽²⁷⁾ The design, monitoring and updating of financial incentives need to take this complex reality into account.

Table 3: Other policy instruments used in the past decade to achieve health-system goals in Ontario (adapted from the ‘sister’ evidence brief)(1)

Policy instruments	Examples	Potential opportunities for future action
Governance arrangements		
<ul style="list-style-type: none"> Legislative accountability to achieve health-system goals related to quality improvement 	<ul style="list-style-type: none"> Excellent Care for All Act requires the development of quality-improvement plans 	<ul style="list-style-type: none"> Sectors not (yet) covered by the Act (i.e., sectors other than hospitals, Community Care Access Centres, long-term care homes, and interprofessional team-based primary care models)
<ul style="list-style-type: none"> Delegated authority to use a range of system levers to achieve health-system goals 	<ul style="list-style-type: none"> Cancer Care Ontario 	<ul style="list-style-type: none"> Sectors other than cancer care (or conditions other than those being addressed through initiatives at Cancer Care Ontario) Potential use as a laboratory for the design, monitoring and updating of financial incentives alongside other policy instruments
<ul style="list-style-type: none"> Delegated authority to use select system-levers to achieve health-system goals 	<ul style="list-style-type: none"> College of Physicians and Surgeons of Ontario 	<ul style="list-style-type: none"> Health-system goals beyond those related to quality improvement (in Independent Health Facilities and Out-of-Hospital Premises) and quality assurance (through continuing-competence requirements for physicians)
<ul style="list-style-type: none"> Delegated authority for public reporting and for supporting the achievement of health-system goals related to quality improvement 	<ul style="list-style-type: none"> Health Quality Ontario (HQQ) 	<ul style="list-style-type: none"> Indicators other than the 40 currently prioritized, many of which deal with wait times and relatively few of which deal with other health-system goals Potential use as a support for the design, monitoring and updating of financial incentives alongside other policy instruments
<ul style="list-style-type: none"> Formalized partnerships that are charged with the achievement of health-system goals 	<ul style="list-style-type: none"> Health Links 	<ul style="list-style-type: none"> Patients other than the high-needs patients currently prioritized Partners other than the primary-care providers, Community Care Access Centres, hospitals and specialists now involved
<ul style="list-style-type: none"> Accreditation or other designation mechanisms for organizations supporting the achievement of health-system goals 	<ul style="list-style-type: none"> Registered Nurses’ Association of Ontario’s Best Practice Spotlight Organizations Accreditation Canada 	<ul style="list-style-type: none"> Professions other than nursing, or practice environments where nurses are not in leadership roles (e.g., much of primary care) Organizations that do not participate in accreditation or do not emphasize the achievement of health-system goals (just their own organizations’ goals)
Financial arrangements		
<ul style="list-style-type: none"> Contracting with organizations to achieve health-system goals 	<ul style="list-style-type: none"> Local Health Integration Networks Community Care Access Centres 	<ul style="list-style-type: none"> Consideration of whether and how financial incentives can complement other contract features
<ul style="list-style-type: none"> Funding of facilities for episodes of care based on clinical pathways 	<ul style="list-style-type: none"> Quality-Based Procedures 	<ul style="list-style-type: none"> Episodes of care other than the 10 currently covered Attention to the design, monitoring and updating of this funding component alongside other hospital funding components (e.g., Health Based Allocation Model)
<ul style="list-style-type: none"> Alternative remuneration models for groups of primary-care providers 	<ul style="list-style-type: none"> Blended capitation and other models 	<ul style="list-style-type: none"> Primary-care providers working in a traditional fee-for-service model
<ul style="list-style-type: none"> Inclusion of drugs or devices on lists of publicly funded ‘technologies’ 	<ul style="list-style-type: none"> Ontario Drug Benefit Program Assistive Devices Program 	<ul style="list-style-type: none"> Appropriate prescribing of drugs or appropriate authorization of devices as key health-system goals

Delivery arrangements		
<ul style="list-style-type: none"> Order sets (and decision-support systems more generally) incorporated in electronic health records 	<ul style="list-style-type: none"> Registered Nurses' Association of Ontario 	<ul style="list-style-type: none"> Order sets produced by groups that don't follow equally evidence-based approaches to order-set development
<ul style="list-style-type: none"> Training and support to achieve health-system goals related to quality improvement 	<ul style="list-style-type: none"> Improving and Driving Excellence Across Sectors (IDEAS) Health Quality Ontario (see above) 	<ul style="list-style-type: none"> Training and support that complement quality-improvement approaches with approaches that have been rigorously evaluated and found to be effective
<ul style="list-style-type: none"> Information and educational materials for achieving health-system goals 	<ul style="list-style-type: none"> Ministry of Health and Long-Term Care's 'Health Bulletins' 	<ul style="list-style-type: none"> Supports for the immediate incorporation of actionable messages into clinical decision-support systems

Additional equity-related observations about the problem

The forgoing assessment included one mention of each of the two 'canaries in the coal mine'. First, at-risk citizens, in this case those living with mental illness, were less likely to receive recommended diabetes assessments – four HbA_{1c} tests, two cholesterol tests and a retinal eye exam – over a two-year time period in response to a financial incentive. However, citizens themselves were never the target of a financial incentive. Second, health organizations and health professionals working with high-needs patients were identified as the explicit focus for Health Links, which as formalized partnerships have the potential to complement financial incentives. As noted in the introduction, financial incentives can inadvertently encourage the prioritization of patients who are easiest to serve over those with the greatest need, and Health Links could offset this (although whether they do has not yet been studied).

THREE POTENTIAL ELEMENTS OF AN APPROACH TO ADDRESSING THE PROBLEM

Many approaches could be selected as a starting point for deliberations about an approach for using financial incentives to achieve health-system goals in Ontario. To promote discussion about the pros and cons of potentially viable approaches, we have selected three elements of a larger, more comprehensive approach to achieving health-system goals. The three elements were developed and refined through consultation with the Steering Committee and key informants who we interviewed during the development of this evidence brief. The elements parallel those used in the ‘sister’ brief about optimizing clinical practice in Ontario based on data, evidence and guidelines and align with the principles articulated in a policy paper written by Hurley et al.(4) The elements are:

- 1) support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals;
- 2) use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals; and
- 3) monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals.

The elements could be pursued separately or simultaneously, or components could be drawn from each element to create a new (fourth) element. They are presented separately to foster deliberations about their respective components, the relative importance or priority of each, their interconnectedness and potential of or need for sequencing, and their feasibility.

The principal focus in this section is on what is known about these elements based on findings from systematic reviews (and, in the case of financial incentives, both overviews of reviews and systematic reviews). It is important to note up front that the reviews (identified in our searches) that address the first and third elements address the elements in a general sense and typically not in the specific context of financial incentives. The reviews specific to financial incentives are discussed in relation to the second element.

We present the findings from systematic reviews along with an appraisal of whether their methodological quality (using the AMSTAR tool) (28) is high (scores of 8 or higher out of a possible 11), medium (scores of 4-7) or low (scores less than 4) (see the appendix for more details about the quality-

Box 4: Mobilizing research evidence about elements of an approach to addressing the problem

The available research evidence about elements for addressing the problem was sought primarily from Health Systems Evidence (www.healthsystemsevidence.org), which is a continuously updated database containing 71 overviews of systematic reviews, 4,658 systematic reviews and more than 2,229 economic evaluations of delivery, financial and governance arrangements within health systems. The overviews, reviews and economic evaluations were identified by searching the database for documents addressing features of each of the approach elements and sub-elements (using our existing taxonomy categories and, in the case of financial incentives specifically, by using both keyword searches of the title and abstract fields, and the relevant taxonomy categories). Given the volume of systematic reviews about financial incentives, priority was given to overviews of reviews. Reviews were included only when they complemented the available overviews of reviews.

The authors’ conclusions were extracted from the documents whenever possible. Some overviews and reviews may contain no studies despite an exhaustive search (i.e., they were “empty” overviews or reviews), while others may conclude that there was substantial uncertainty about the element based on the identified reviews or studies. Where relevant, caveats were introduced about these authors’ conclusions based on assessments of the overviews’ or reviews’ quality, the local applicability of the findings, equity considerations, and relevance to the issue. (See the appendices for a complete description of these assessments.)

Being aware of what is not known can be as important as being aware of what is known. When faced with an empty overview or review, substantial uncertainty, or concerns about quality and local applicability or lack of attention to equity considerations, primary research could be commissioned, or an element could be pursued and a monitoring and evaluation plan designed as part of its implementation. When faced with an overview or review that was published many years ago, an updating of the review could be commissioned if time allows.

No additional research evidence was sought beyond what was included in the overview or review. Those interested in pursuing a particular element may want to search for a more detailed description of the element or for additional research evidence about the element.

appraisal process). We also highlight whether they were conducted recently, which we define as the search being conducted within the last five years. In the next section, the focus turns to the barriers to adopting and implementing these elements, and to possible implementation strategies to address the barriers.

Element 1: Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals

This element is implicit in the second principle articulated by Hurley et al.,⁽⁴⁾ namely that financial incentives need to be individually crafted for each specific context. Sub-elements might include activities to:

- identify the citizen (or patient) behaviours, clinical practices and/or organizational behaviours to be changed – in order to achieve health-system goals – based on:
 - explicit criteria (e.g., performance data that show a lack of improvement over time or a shortfall relative to peers) or divergence from evidence from systematic reviews or from guidelines; and
 - high-quality data and evidence, and systematically elicited tacit knowledge, views and experiences of key stakeholders (including citizens);
- specify who needs to do what differently;
- ascertain the causes of the problem as it affects those who need to do things differently;
- engage key stakeholders to assess the first three bullets and identify the appropriate level (e.g., organizational, provincial) at which the problem should be considered (using qualitative or quantitative methods); and
- iteratively refine the understanding of the problem as necessary and select an optimal description of the problem, its causes, and the level at which it can most helpfully be considered.

Engaging in the general process described by the sub-elements above could be achieved by using a systematic/structured approach to identify the behaviours and practices to be changed, and by using iterative/theory-based approaches to identify the underlying causes of problems in those behaviours and practices.

As noted in the ‘sister’ evidence brief: One possible systematic procedure is conducting and then periodically updating a systematic review that identifies key areas of clinical practice that need to be optimized in the province. An example of this is an older high-quality systematic review that assessed the magnitude and the nature of clinical quality problems in general practice in the United Kingdom, Australia and New Zealand,⁽²⁹⁾ and a similar approach is currently being planned for Canada by Squires et al. at the University of Ottawa. This could also be completed in tandem with a comprehensive, integrated checklist that was developed in a recent medium-quality review to identify factors that might prevent or enable improvements in clinical practice (or more generally, to identify the determinants of practice).⁽³⁰⁾ Based on 12 checklists that were identified in the review, an integrated checklist with 57 potential determinants of practice was developed (many of which include theory-based elements). The determinants of practice were grouped into the following seven domains:

- guideline factors (e.g., whether recommendations are based on strong evidence, feasible and appropriate);
- individual health professional factors (e.g., knowledge/skills, attitudes and behaviours);
- patient factors (e.g., patient needs, beliefs, knowledge, preferences, motivation and behaviour);
- professional interactions (e.g., communication and influence, team processes, and referral processes);
- 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);
- capacity for organizational change (e.g., mandate, authority, accountability and leadership); and
- 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.(30)

Theory-based approaches are different in that they focus more on iteratively testing and refining an approach based on an existing theory (e.g., by drawing on theories related to behaviour change) to ensure it is attuned to the underlying causes of a problem. Several frameworks have been published related to the process of developing implementation interventions with the goal of changing behaviour. The Behaviour Change Wheel (31) and the Theoretical Domains Framework (32) are two well-known and extensively used frameworks in this area.

The Behaviour Change Wheel was developed through a recent medium-quality systematic review of 19 frameworks of behaviour change. 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).(31) 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).(31)

The Theoretical Domains Framework, which was developed through an expert consensus process and validation exercise, offers a process to identify relevant psychological and organizational theory to support clinical behaviour change at the individual level.(32;33) A recent application of this approach indicates that 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:

- 1) identifying gaps between evidence and practice (using explicit criteria and high-quality data and evidence);
- 2) identifying the types of behaviours that need to change in order to reduce or eliminate the evidence-to-practice gap; and
- 3) specifying the health professional groups that need to change behaviour.(32)

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).(34)

While designed to support changes in clinical practice to achieve health-system goals, there are parallels that could also be used to support changes in citizen and organizational behaviours. However, given that financial incentives are primarily being used in Ontario to support changes in clinical practice, we have kept this focus here (as we had in the ‘sister’ evidence brief).

A key component of both structured/standardized and iterative/theory-based approaches is the need to first engage in a stakeholder-engagement process to specify who needs to do what differently, and to ascertain the causes of the problem. We identified one systematic review that assessed stakeholder-engagement processes for program evaluation,(35) four reviews that evaluated public and consumer engagement processes,(36-39) and no reviews that evaluated the most salient stakeholder group – health professionals – for the types of examples provided in Table 1.

The review about stakeholder engagement found limited research evidence about stakeholder involvement in program evaluation. However, the review did find that there was considerable overlap in the key features of stakeholder-engagement processes in the literature, and 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.(35)

Of the four reviews about public and consumer engagement, two indicated that it can be helpful for improving the dissemination of information and processes for developing interventions, as well as for enhancing awareness and understanding among citizens.(37;39) However, all of the reviews 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. As one example of the form that such processes can take, Patients Canada engages citizens in the development of key-performance targets for Ontario’s health system.

A summary of the key findings from the synthesized research evidence is provided in Table 4. For those who want to know more about the systematic reviews contained in Table 4 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 1.

Table 4: Summary of key findings from systematic reviews relevant to Element 1 – Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals (reproduced, with minor changes, from the ‘sister’ evidence brief)(1)

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Engage key stakeholders to assess sub-elements 1-3 <ul style="list-style-type: none"> ○ An older high-quality review found some evidence that community (i.e., public and consumer) engagement improves the dissemination of information and processes for developing interventions.(39)
Potential harms	<ul style="list-style-type: none"> • None identified
Costs and/or cost-effectiveness in relation to status quo	<ul style="list-style-type: none"> • None identified
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	<ul style="list-style-type: none"> • Uncertainty because no systematic reviews were identified <ul style="list-style-type: none"> ○ Identify the citizen (or patient) behaviours, clinical practices and/or organizational behaviours to be changed in order to achieve health-system goals <ul style="list-style-type: none"> ▪ No reviews specified benefits, harms and costs, but three provide descriptions of key features of approaches that could be used (see below). ○ Specify who needs to do what differently ○ Ascertain the causes of the problem ○ Engage key stakeholders to assess sub-elements 1-3 <ul style="list-style-type: none"> ▪ No reviews addressed the engagement of health professionals ○ Iteratively refine the understanding of the problem as necessary and select an optimal description of the problem, its causes, and the level at which it can most helpfully be considered • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Not applicable • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ Engage key stakeholders to assess sub-elements 1-3

	<ul style="list-style-type: none"> ▪ A recent medium-quality review indicated that while there is some evidence to support the developmental role of public involvement (e.g., for enhancing awareness and understanding among citizens), no clear conclusions can be drawn due to lack of clarity about what success looks like.(37) ▪ Another medium-quality but older review similarly found few studies that described the effects of involving patients in the planning and development of healthcare.(38)
<p>Key features of the element if it was tried elsewhere</p>	<ul style="list-style-type: none"> • Identify the citizen (or patient) behaviours, clinical practices and/or organizational behaviours to be changed in order to achieve health-system goals <ul style="list-style-type: none"> ○ An older high-quality review used a systematic approach to assess the magnitude and the nature of clinical quality problems in general practice in the United Kingdom, Australia and New Zealand,(29) and similar reviews could be conducted and periodically updated in Ontario (or other jurisdictions) to identify areas of practice in the province that need to be optimized. ○ A recent medium-quality review outlined a structured approach to identify factors that might prevent or enable improvements in clinical practice through an integrated checklist and five worksheets designed to support the development of tailored implementation strategies based on the areas identified as warranting targeted implementation effort.(30) ○ The Behaviour Change Wheel, which was developed using a recent medium-quality review, supports the identification of behaviours associated with underlying causes of a particular problem and designing interventions to address areas where the need for behaviour change has been prioritized.(31) • Engage key stakeholders to assess sub-elements 1-3 <ul style="list-style-type: none"> ○ Four reviews focused on public and consumer engagement. <ul style="list-style-type: none"> ▪ An older medium-quality 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.”(38) ▪ An older high-quality review indicated that community-engagement activities used a variety of approaches, including convening community groups, committees and workshops, and engaging educators, champions and volunteers.(39) ▪ A recent medium-quality review about public involvement in healthcare policy found that key features of public involvement are poorly defined and rarely detailed.(37) ▪ A recent low-quality review outlined that having the potential to find common ground is a requirement for using public engagement to address issues, and that common goals include activities related to developing policy direction, recommendations and tools, priority setting, resource allocation and risk assessments.(36) ▪ The same review indicated that public-engagement processes include three broad characteristics: 1) a sponsor seeking input from the public; 2) participants considering an ethical- or values-based dilemma; and 3) provision of accurate and balanced information to participants about the dilemma.(36) ○ A recent medium-quality review indicated that there was considerable overlap in the key features of stakeholder-engagement processes in the literature, and found that the methodological centrepiece of stakeholder involvement is entering into collaboration with a collective willingness to participate, and that draws on the strengths of each member while respecting their unique positions and expertise.(35)
<p>Stakeholders’ views and experience</p>	<ul style="list-style-type: none"> • Engage key stakeholders to assess sub-elements 1-3 <ul style="list-style-type: none"> ○ Case studies including project administrators’ views about public engagement in the planning and development of healthcare in an older medium-quality review provided support to the view that patient engagement has contributed to changes in services.(38)

Element 2: Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals

This element aligns with both the second principle articulated by Hurley et al.,(4) namely that financial incentives need to be individually crafted for each specific context, and the first principle, which states that financial incentives should complement rather than be a substitute for other policy instruments. Sub-elements might include activities to:

- select candidate strategies and techniques (active ingredients – e.g., financial incentives, educational materials, and audit and feedback) based on a theoretical framework, research evidence and other inputs, and on an understanding of the issue and context;
- assess how the active ingredients are likely to function (causal mechanisms – e.g., motivate) in relation to what's known about the issue and context;
- consider how, by whom and at what level the active ingredients could be communicated/delivered (mode of delivery – e.g., website, personalized email, electronic health record) in light of what's known about the issue and context;
- articulate what the active ingredients aim to change (intended targets – e.g., motivation, tasks, roles, rules, strategies);
- engage key stakeholders to assess the first four bullets and identify barriers and facilitators to the approach;
- iteratively revise the approach as necessary and select an optimal approach; and
- advocate for, recommend or implement a chosen approach that is appropriate to the issue and context (i.e., acceptable, affordable and feasible).

Financial incentives, which are the key 'active ingredient' being focused on in this evidence brief, have been extensively evaluated for their effects and acceptability. As noted in Box 4, given the volume of systematic reviews about financial incentives, priority was given to overviews of reviews (and one overview of reviews examining citizen-targeted incentives, four overviews of reviews examining health professional-targeted incentives and two overviews of reviews examining both health professional- and health organization-targeted incentives were included). Reviews were included only when they complemented the available overviews of reviews (and four reviews examining citizen-targeted incentives, two reviews examining health professional-targeted incentives, one review examining health organization-targeted incentives, two reviews targeting both health professional- and health organization-targeted incentives, and one non-systematic review containing a costing study were included). In brief, the key messages emerging from these overviews and reviews (Table 5) include:

- 1) 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),(40) 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),(41-43) or require substantial cash incentives to sustain behaviour changes (e.g., for smoking cessation);(44)
- 2) the reviews of the evidence for the use of financial incentives for health professionals,(45-49) health organizations (50) and for both health professionals and health organizations,(51-53) found that evidence is either insufficient,(47;49;52;53) modest and of variable effects,(46;48) or based on perceived outcomes (e.g., organizational leaders),(50) 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)(46;52) or for specific types of conditions (e.g., for chronic rather than acute care),(51) but not for other more complex behaviours (e.g., improving adherence to clinical guidelines)(46) or over the long term (e.g., retention of human resources);(45) and
- 3) 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) (40;54) 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)(41;55) can be very important.

For those who want to know more about the overview of reviews and the systematic reviews contained in Table 5 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 2.

Table 5: Effects and acceptability of financial incentives

Target of the incentive	Key findings related to effects and acceptability	Comments related to their design and how they're complemented by other policy instruments
Citizens/ patients	<ul style="list-style-type: none"> • A recent overview of systematic reviews concluded that there is some evidence to support the use of financial incentives for improving adherence to medicines by consumers, but that the evidence is inconsistent.(40) • Two recent high-quality reviews (41;43) and one recent medium-quality review (42) assessed financial incentives for encouraging healthy behaviours (e.g., achieving sustained changes in smoking, eating, alcohol consumption and physical activity) and found that they: <ul style="list-style-type: none"> ○ were generally more effective than providing no financial incentive for health behaviour change, and that on average have greater effects when cash-only incentives are used as compared to other formats;(41) ○ increased attainment and maintenance (up to 18 months from baseline) of target levels of behaviour change;(43) ○ sustained change in overall behaviour up to 2-3 months after the removal of incentive, but this change was not maintained thereafter;(43) ○ had a decreased effect over time, with increased post-intervention follow-up and increased incentive value;(41-43) ○ were more accepted if they are found to be effective, safe, recipient-focused, intrusion-minimizing and viewed as benefiting both recipients and wider society, but may also be perceived as paternalistic, which can undermine an individual's autonomy.(42) • A recent high-quality review that assessed financial incentives for supporting long-term smoking cessation found that: <ul style="list-style-type: none"> ○ incentives may boost cessation rates while in place, but that sustained success rates are seen only where resources were concentrated into substantial cash payments for abstinence; and ○ incentives for pregnant smokers may improve cessation rates, both at end-of-pregnancy and post-partum assessment stages.(44) 	<ul style="list-style-type: none"> • While one review found that average effects on health behaviour change were greater for cash-only incentives, it found that when used for vaccination or screening attendance, cash plus other motivational components were more effective than vouchers alone.(41)
Professionals	<ul style="list-style-type: none"> • A recent overview of systematic reviews found mixed evidence for the use of financial incentives for addressing human-resource challenges in healthcare (e.g., job satisfaction, turnover rates, recruitment and retention), and noted that while incentives improved healthcare-provider recruitment, they were less effective at supporting five-year retention.(45) • There are mixed results for financial incentives to improve healthcare professional behaviours and patient outcomes: <ul style="list-style-type: none"> ○ a recent overview of systematic reviews found that payments for service, providing care to specific populations, providing a pre-specified level of care, changing activity, as well as improving quality, processes of care, referrals, admissions and prescribing costs, were effective;(46) ○ the same overview noted that payments for working a specified time period, improving 	<ul style="list-style-type: none"> • An older high-quality review of financial incentives for improving the quality of care provided by primary-care physicians found that the following characteristics influenced the effectiveness of financial incentives: <ul style="list-style-type: none"> ○ amount and method of payment (salary, fee-for-service, performance bonus, payment target for individual or team, timing); ○ importance of the additional income relative to other motivators (e.g., intrinsic

	<p>consultation or visit rates and promoting compliance with guidelines are ineffective;(46)</p> <ul style="list-style-type: none"> ○ a high-quality review that was published more recently than the overview found mixed effects for the use of pay-for-performance schemes for healthcare providers to improve quality of patient care and patient-relevant outcomes, and concluded that current evidence targeting individual practitioners is insufficient to support its adoption;(47) and ○ an older high-quality review similarly found modest and variable effects of financial incentives on improving the quality of healthcare provided by primary-care physicians.(48) <ul style="list-style-type: none"> • A recent overview of systematic reviews assessed interventions for supporting nurse retention in rural and remote areas and found that the evidence supporting the effectiveness of direct and indirect financial incentives (e.g., direct payment, service-requiring scholarships, educational loans with service requirements and loan repayment programs) on long-term nurse retention was very limited.(49) 	<p>motivation or other extrinsic motivators such as autonomy);</p> <ul style="list-style-type: none"> ○ opportunity costs of changing behaviour; ○ heterogeneity across physicians; and ○ heterogeneity in marginal costs of changing behavior (e.g., administration costs).(48) <ul style="list-style-type: none"> • A recent overview of reviews noted that there is some (but weak) evidence to suggest that financial incentives for promoting generic drug prescribing may be most effective when combined with educational interventions and audit/feedback.(55)
Organizations	<ul style="list-style-type: none"> • A recent high-quality systematic review that assessed leaders' experiences and perceptions implementing activity-based funding and pay-for-performance hospital funding models found that: <ul style="list-style-type: none"> ○ perceived benefits for activity-based funding included improved productivity and efficiency, ability to reallocate funds, support for greater emphasis on evaluation, accountability and discharge planning, improved data accuracy, improved collaboration and communication, and improved quality and enhanced organizational transparency were associated with pay-for-performance models; ○ 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; and ○ barriers 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), and commitment factors (e.g., leaders' skepticism or suspicion about the funding model).(50) 	<ul style="list-style-type: none"> • The same high-quality systematic review found that pre-requisites for success include: 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 data; committed leaders who are supportive of the funding model; and involving physician leaders to support accurate data collection and to act as 'champions'.(50)
Both professionals and organizations	<ul style="list-style-type: none"> • A recent overview of systematic reviews indicated that: <ul style="list-style-type: none"> ○ pay-for-performance programs were generally more effective for chronic care than acute care; ○ pay-for-performance programs did not have a negative effect on access; ○ key features of effective pay-for-performance programs included lower baseline levels, involvement of stakeholders in target selection, and the utilization of process indicators instead of outcome measures; ○ implementation of pay-for-performance yielded stronger effects where new funds were available and where there was sufficient awareness about the elements of the programs; ○ there is no clear association between incentive size and the effectiveness of pay-for-performance programs; ○ incentives targeted at the individual or team level achieve more positive results than those targeted at the hospital level; and ○ the majority of the evidence suggests that England's 'quality and outcomes framework' (a pay- 	<ul style="list-style-type: none"> • An older medium-quality review noted that 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.(54) • A recent overview of reviews found that the risks associated with results-based financing include: motivating unintended behaviours;

	<p>for-performance scheme that rewards general practitioners for the quality of care they provide, but that also involved many other simultaneous changes, such as EHRs) is associated with some improved quality-of-care processes and intermediate patient outcomes (e.g., blood pressure and cholesterol levels).(51)</p> <ul style="list-style-type: none"> • A recent overview of systematic reviews found that there are few rigorous studies of results-based financing, but that financial incentives for healthcare professionals appear to be effective in the short-run for simple, distinct and well-defined behavioural goals (but that there is less evidence supporting long-term changes).(52) • An older non-systematic review found one study that reported on the cost-effectiveness of a pay-for-performance program, and found that the estimated cost per quality-adjusted life years saved ranged from \$13,000 to \$30,000.(56) • A recent medium-quality review comparing best practice pricing, normative pricing, quality structures pricing models, and pay-for-performance schemes found insufficient evidence to conclude which model is the most beneficial, but indicated that the incentives need to be substantial to generate change in behaviour and practice, and need to be provided at a clinical department-level in order to improve quality and safety of clinical care.(53) 	<p>ignoring important tasks that are not rewarded with incentives; improving or cheating on reporting rather than improving performance; widening the resource gap between rich and poor; and dependency on financial incentives.(52)</p>
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As noted in the ‘sister’ evidence brief, many candidate strategies and techniques (active ingredients) and methods for delivering them to optimize clinical practice (i.e., provider-targeted implementation strategies) have been evaluated, and as of January 2015 there were 908 systematic reviews evaluating provider-targeted implementation strategies in Health Systems Evidence (www.healthsystemevidence.org). While assessing these reviews is beyond the scope of this brief, 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.⁽⁵⁷⁾ In Table 6 we provide an overview of the key features identified for each of the eight strategies profiled in the review, which includes their causal mechanisms (based on those identified in the Behaviour Change Wheel described in element 1), mode of delivery, and intended targets.

This set of EPOC reviews found beneficial effects of optimizing clinical practice for educational materials,⁽⁵⁸⁾ educational meetings,⁽⁵⁹⁾ educational outreach visits,⁽⁶⁰⁾ local opinion leaders,⁽⁶¹⁾ audit and feedback,⁽⁶²⁾ computerized reminders,⁽⁶³⁾ and tailored interventions.⁽⁶⁴⁾ 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.⁽⁶⁵⁾

A notable finding across these reviews is that the absolute effect sizes are similar (from 2% to 12% improvements in outcomes), but have 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.⁽⁵⁷⁾ This interpretation makes it even more essential to engage in the set of activities – outlined in the description of the first element – 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 outlined in element 1, 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.”⁽³¹⁾ Furthermore, efforts to tailor interventions need to draw on the broader categories of interventions outlined in Table 6, 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.⁽⁶⁶⁾

Table 6: 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 (57) and the table reproduced from the ‘sister’ evidence brief)(1)

Description of candidate strategy/technique (active ingredients)	Causal mechanisms*	Mode of delivery	Intended targets
<p>Printed educational materials (58)</p> <ul style="list-style-type: none"> • “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 	<ul style="list-style-type: none"> • Education • Training 	<ul style="list-style-type: none"> • Delivered personally or through mass mailings 	<ul style="list-style-type: none"> • Knowledge and potential skill gaps of individual clinicians • Motivation (when written as a persuasive communication)
<p>Educational meetings (59)</p> <ul style="list-style-type: none"> • “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 	<ul style="list-style-type: none"> • Education • Training • Persuasion 	<ul style="list-style-type: none"> • Didactic or interactive meetings 	<ul style="list-style-type: none"> • Knowledge (for didactic approach) or knowledge, attitudes and skills (for interactive approach) at the individual healthcare professional/peer group level
<p>Educational outreach (60)</p> <ul style="list-style-type: none"> • “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 	<ul style="list-style-type: none"> • Education • Training • Persuasion 	<ul style="list-style-type: none"> • The detailer aims to get a maximum of three messages across during a 10- to 15-minute meeting with a clinician 	<ul style="list-style-type: none"> • Knowledge and attitudes through a social-marketing approach (67) • 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
<p>Local opinion leaders (61)</p> <ul style="list-style-type: none"> • “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,(68) and opinion leaders were not stable over time (69) • 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 	<ul style="list-style-type: none"> • Persuasion 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

McMaster Health Forum

<p>Audit and feedback (70;71)</p> <ul style="list-style-type: none"> • “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 	<ul style="list-style-type: none"> • Education • Persuasion • Enablement • Modelling 	<ul style="list-style-type: none"> • Information extracted from medical records, computerized databases, or observations from patients • Summary of performance may include recommendations for clinical action and action planning 	<ul style="list-style-type: none"> • 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%) (72)
<p>Reminders (63)</p> <ul style="list-style-type: none"> • “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.(73) 	<ul style="list-style-type: none"> • Environmental restructuring 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Prompt health professionals to recall information and remind them to perform or avoid some action to aid individual patient care (74)
<p>Tailored interventions (64)</p> <ul style="list-style-type: none"> • “Strategies to improve professional practice that are planned taking account of prospectively identified barriers to change.” 	<ul style="list-style-type: none"> • Dependent on the composition of the tailored strategy 	<ul style="list-style-type: none"> • Dependent on the composition of the tailored strategy 	<ul style="list-style-type: none"> • Professional practice based on prospectively identified barriers to change
<p>Multifaceted interventions (65)</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Dependent on the composition of the multifaceted strategy 	<ul style="list-style-type: none"> • 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 <i>a priori</i> rationale based on possible causal mechanisms or an ‘everything but the kitchen sink’ approach is used for the choice of components in multifaceted interventions 	<ul style="list-style-type: none"> • 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 (31)

A summary of the key findings from the synthesized research evidence is provided in Table 7. For those who want to know more about the systematic reviews contained in Table 7 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 2.

Table 7: Summary of key findings from systematic reviews relevant to Element 2 – Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals (reproduced, with minor changes, from the ‘sister’ evidence brief)(1)

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Select candidate strategies and techniques (active ingredients) based on a theoretical framework, research evidence and other inputs, and on an understanding of the issue and context <ul style="list-style-type: none"> ○ One overview of reviews,(40) three high-quality reviews (41;43;44) and one medium-quality review (42) 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),(40) 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),(41-43) or require substantial cash incentives to sustain behaviour changes (e.g., for smoking cessation).(44) ○ Five overviews of reviews,(45;46;49;51;52) three high-quality reviews (47;48;50) and one medium-quality review (53) focused on the use of financial incentives for health professionals,(45-49) organizations,(50) and for both health professionals and organizations,(51-53) and found that evidence is either insufficient,(47;49;52;53) modest and of variable effects (46;48) or based on perceived outcomes (e.g., organizational leaders),(50) 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),(46;52) for specific types of conditions (e.g., for chronic rather than acute care),(51) or for improving process-related outcomes, but not for other more complex behaviours (e.g., improving adherence to clinical guidelines)(46) or over the long-term (e.g., retention of human resources).(45) ○ High-quality systematic reviews found absolute effect sizes related to changing practice ranging from 2%-12% for printed educational materials, educational meetings, educational outreach, local opinion leaders, audit and feedback, computerized reminders, and tailored interventions.(58-64)
Potential harms	<ul style="list-style-type: none"> • Possible risks associated with results-based financing include: motivating unintended behaviours; ignoring important tasks that are not rewarded with incentives; improving or cheating on reporting rather than improving performance; widening the resource gap between rich and poor; and dependency on financial incentives.(52)
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> • An older non-systematic review found one study that reported on the cost-effectiveness of a pay-for-performance program, and found that the estimated cost per quality-adjusted life years saved ranged from \$13,000 to \$30,000.(56)* • While costs of interventions can vary substantially, they need to be assessed in relation to the full chain of events from intervention, the resulting improvements in clinical practice, and the subsequent cost savings at the system level. For example, a cost-effectiveness analysis using this perspective for educational outreach found that it was cost saving with an approximate absolute effect of 5%.(75)
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	<ul style="list-style-type: none"> • Uncertainty because no systematic reviews were identified <ul style="list-style-type: none"> ○ Iteratively revise the approach as necessary and select an optimal approach • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Not applicable • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ Not applicable

McMaster Health Forum

<p>Key features of the element if it was tried elsewhere</p>	<ul style="list-style-type: none"> • Cash incentives for promoting healthy behaviours in citizens on average have greater effects as compared to other formats,(41) and sustained success rates are seen when resources are concentrated into substantial cash payments.(44) • A recent overview of systematic reviews indicated that key features of effective pay-for-performance programs included lower baseline levels, involvement of stakeholders in target selection, utilization of process indicators instead of outcome measures, making new funds available, sufficient awareness about the elements of the program(s), and incentives targeted at the individual or team level (as opposed to the hospital/organizational level).(51) • Key considerations for designing and implementing financial incentives to improve quality of care provided by primary-care physicians that were identified in an older high-quality review include: <ul style="list-style-type: none"> ○ amount and method of payment (salary, fee-for-service, performance bonus, payment target (individual or team), timing); ○ importance of the additional income relative to other motivators (e.g., intrinsic motivation or other extrinsic motivators such as autonomy); ○ opportunity costs of changing behaviour; ○ heterogeneity across physicians; and ○ heterogeneity in marginal costs of changing behaviour (e.g., administration costs).(48) • A recent overview of reviews noted that there is some (but weak) evidence to suggest that financial incentives for promoting generic drug prescribing may be most effective when combined with educational interventions and audit/feedback.(55)
<p>Stakeholders' views and experience</p>	<ul style="list-style-type: none"> • A recent, medium-quality review found that financial incentives targeting citizens were more accepted if they are found to be effective, safe, recipient-focused and intrusion-minimizing, but may also be perceived as paternalistic, which can undermine an individual's autonomy(42)

*Single studies from Ontario document the total cost of the financial incentives paid to physicians, however, these were not part of a formal cost-effectiveness analysis and so they have not been included here.

Element 3: Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals

This element aligns with the third principle articulated by Hurley et al., namely that financial incentives need to be regularly monitored, evaluated and updated.(4) Sub-elements might include activities to:

- monitor the extent of implementation of the financial incentives and other active ingredients and their uptake across different modes of delivery;
- (when resources allow) evaluate the impacts of the approach on its intended targets (effectiveness study) and possibly on other targets for whom it could have unintended consequences and in terms of impacts on equity, its costs and cost-effectiveness, the causal mechanism (process evaluation), and the views and experiences of those involved (acceptability study); and
- review the approach based on monitoring and evaluation data (as well as updated syntheses of the available evidence about the behaviours to be changed) to decide whether it should be stopped, modified or scaled up.

As we noted in the ‘sister’ evidence brief, while not directly relevant to this element, we found three systematic reviews related to quality-improvement interventions,(76-78) although none of them included the use of financial incentives. We also outline below the key components of the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework,(79) which has been used extensively to improve the sustainable adoption and implementation of effective, generalizable, evidence-based interventions.(80) A summary of the key findings from the synthesized research evidence is provided in Table 8, and a summary of the RE-AIM components and guiding questions is provided in Table 9. For those who want to know more about the systematic reviews contained in Table 8 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 4.

Quality-improvement interventions may offer helpful insight about efforts to monitor, evaluate and review selected approaches, given the overall focus of quality improvement on using a formalized and systematic approach to assessing performance and making changes to achieve desired goals.(81) One older medium-quality review found that collaborative quality-improvement interventions contributed to improvements in processes of care, patient care and organizational performance.(77) Another older but low-quality review found that patient- or clinician-driven quality improvement was more effective than approaches driven by managers or policymakers,(78) although it is hard to imagine policymakers not driving the design and execution of financial incentives. Lastly, an older medium-quality review found several contextual factors that were associated with quality-improvement success, which include: leadership from top management; a supportive organizational culture; availability of data infrastructure and information systems; experience with or years involved in quality improvement; physician involvement; motivation to change; sufficient resources; and effective team leadership.(76) The same review 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.(76)

The goal of the RE-AIM framework “is to encourage program planners, evaluators, readers of journal articles, funders, and policy-makers to pay more attention to essential program elements, including external validity, that can improve the sustainable adoption and implementation of effective, generalizable, evidence-based interventions,”(82) and well-designed financial incentives could be considered as one such intervention. In general, RE-AIM provides a starting point for systematically assessing the impact of programs and policies by facilitating the assessment of their reach, effectiveness, adoption, implementation and maintenance. Using information extracted from the RE-AIM framework, we provide in Table 9 the broad guidelines and questions to address when using the framework to assess the impact of interventions.(83) Collectively, these components can be used to assess impact at both the individual (i.e., end-user) and organizational (i.e., delivery agent) level (80) as part of a monitoring and evaluation plan to ensure that financial incentives and complementary policy instruments achieve health-system goals.

Table 8: Summary of key findings from systematic reviews relevant to Element 3 – Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals (reproduced, with minor changes, from the ‘sister’ evidence brief)(1)

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Monitor the extent of implementation of the financial incentives and other active ingredients and their uptake across different modes of delivery <ul style="list-style-type: none"> ○ Quality improvement <ul style="list-style-type: none"> ▪ A medium-quality but older review found a positive effect for collaborative quality-improvement interventions on processes of care, patient care and organizational performance as a result of participation in a quality-improvement collaborative.(77) ▪ Another review that was conducted recently but was of low quality found clinician/patient-driven quality-improvement interventions were effective, but that manager/policymaker-driven approaches were less effective.(78) ▪ The same review also found that the most effective quality-improvement strategies included clinician-directed audit and feedback, decision support systems and the use of small-group discussions in continuing medical education.
Potential harms	<ul style="list-style-type: none"> • None identified
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> • None identified
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	<ul style="list-style-type: none"> • Uncertainty because no systematic reviews were identified <ul style="list-style-type: none"> ○ (When resources allow) evaluate the impacts of the approach on its intended targets, its costs and cost-effectiveness, the causal mechanism and views and experiences of those involved ○ Review the approach based on monitoring and evaluation data to decide whether it should be stopped, modified or scaled up • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Not applicable • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ Not applicable
Key features of the element if it was tried elsewhere	<ul style="list-style-type: none"> • Monitor the extent of implementation of the financial incentives and other active ingredients and their uptake across different modes of delivery <ul style="list-style-type: none"> ○ An older medium-quality review found several contextual factors that were associated with quality improvement success, which include: leadership from top management; a supportive organizational culture; availability of data infrastructure and information systems; experience with/years involved in quality improvement; physician involvement; motivation to change; sufficient resources; and effective team leadership.(76) ○ 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.(76)
Stakeholders’ views and experience	<ul style="list-style-type: none"> • None identified

Table 9: RE-AIM elements and questions to ask (*reproduced with permission from Gaglio and Glasgow 2012) (83)

RE-AIM element	Questions to ask
Reach <ul style="list-style-type: none"> Percent and representativeness of participants 	<ul style="list-style-type: none"> Can the program attract a large and representative percent of the target population? Can the program reach those most in need and most often left out?
Effectiveness <ul style="list-style-type: none"> Impact on key outcomes, quality of life, unanticipated outcomes and sub-groups 	<ul style="list-style-type: none"> Does the program produce robust effects across sub populations? Does the program produce minimal negative side effects and increase quality of life or broader outcomes?
Adoption <ul style="list-style-type: none"> Percent and representativeness of settings and staff that participate 	<ul style="list-style-type: none"> Is the program feasible for the majority of real-world settings in terms of costs, expertise, resources, etc.? Can it be adopted by low-resource settings and typical staff serving high-risk populations?
Implementation <ul style="list-style-type: none"> Consistency and cost of delivering the program and any adaptation made 	<ul style="list-style-type: none"> Can the program be consistently implemented across program elements, different staff and over time? Are the costs (e.g., personnel, upfront, marginal, scale up and equipment costs) reasonable and proportionate to effectiveness?
Maintenance <ul style="list-style-type: none"> Long-term effects at individual and setting levels 	<ul style="list-style-type: none"> Does the program include principles to enhance long-term improvements (e.g., follow-up contact, community resources, peer support and ongoing feedback)? Can the settings sustain the program over time without added resources and leadership?

Additional equity-related observations about the three options

The reviews (and overviews) we identified for each of the three elements did not provide specific observations related to either of our two ‘canaries in the coal mine.’ While there are studies that address these prioritized groups (e.g., hospitals serving poor patients),(84) these studies have not been reviewed systematically.

IMPLEMENTATION CONSIDERATIONS

A number of barriers might hinder implementation of the three elements of a potentially comprehensive approach to using financial incentives to achieve health-system goals, which needs to be factored into any decision about whether and how to pursue any given element (Table 10). While potential barriers exist at the levels of providers, organizations and systems, perhaps the biggest barrier lies in shifting to a more dynamic approach to financial incentives, which involves more rigorous monitoring and evaluation, and more time-limited uses of financial incentives. Patients/citizens, on the other hand, are unlikely to be aware of or particularly interested in the specifics of these approach elements.

Table 10: Potential barriers to implementing the elements

Levels	Element 1: Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals	Element 2 - Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals	Element 3 - Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals
Patient/individual	<ul style="list-style-type: none"> Likely not visible to patients except for those systematically engaged in the prioritization process, or the relatively small numbers of patients who attempt to influence the process to ensure it addresses their own needs 		
Care provider	<ul style="list-style-type: none"> Some professionals may resist the prioritization of particular health-system goals 	<ul style="list-style-type: none"> Some professionals may resist particular financial incentives or related policy instruments, particularly if they involve re-allocations across providers as they are likely to do in a period of zero growth in budgets 	<ul style="list-style-type: none"> Some professionals may resist monitoring and evaluation, particularly if they involve public reporting and overly frequent changes to their practice
Organization	<ul style="list-style-type: none"> Some groups and organizations may not have the staff to participate in the assessments 	<ul style="list-style-type: none"> Some groups and organizations may not have the staff to participate in the approaches Some groups and staff may not have the key success factors in place (as outlined in the paragraph following the table) 	<ul style="list-style-type: none"> Some groups and organizations may not have the infrastructure to participate in monitoring and evaluation
System	<ul style="list-style-type: none"> System leaders may not want to invest in a more rigorous and dynamic approach 	<ul style="list-style-type: none"> System leaders may not want to invest in a more rigorous and dynamic approach (50) 	<ul style="list-style-type: none"> System leaders may not want to invest in a more rigorous and dynamic approach

As we noted in the ‘sister’ evidence brief, a recent low-quality review that assessed the sustainability of new programs and interventions found that partial sustainability was more common than the continuation of the entire program or intervention (even when full implementation was initially achieved).(85) The same review indicated that fidelity ratings used to assess sustainability at the care-provider level found that less than half sustained the program or intervention at high levels of fidelity, and proposed that fidelity-maintenance strategies are needed as part of implementation efforts. Such strategies could draw on the findings of a recent, medium-quality systematic review that identified the key success factors for implementation to be: “1) the organization and staff have planned for the initiative; 2) there are enough people with necessary and synergistic skills to implement the initiative; 3) there are capabilities and a receptiveness for change; 4) the chosen implementation [approach] meets needs and is the best fit for the organization and stakeholders; 5)

the necessary human and financial resources are available for implementation; 6) there is support and momentum throughout the implementation process; and 7) processes to support mid-to-long-term acceptance are established during preparation and anchored throughout the implementation process.”(86)

On the other hand, a number of potential windows of opportunity could be capitalized upon (Table 11), which also need to be factored into any decision about whether and how to pursue one or more of the approach elements. These potential windows of opportunity include a growing focus on achieving health-system goals, and a willingness on the part of key health-system policymakers and stakeholders to learn from past experience.

Table 11: Potential windows of opportunity for implementing the elements

Type	Element 1: Support dynamic efforts to identify the factors that are hindering the achievement of particular health-system goals	Element 2 - Use rigorous processes to design and execute financial incentives and other complementary policy instruments to achieve particular health-system goals	Element 3 - Monitor, evaluate and review the financial incentives and other complementary policy instruments used to achieve particular health-system goals
General	<ul style="list-style-type: none"> • The Excellent Care for All Act provides a legislative impetus to achieve health-system goals related to quality improvement, with quality defined in a very broad way (87) • A newly elected leader of the governing party and a relatively recently elected majority government provide an opportunity to introduce and institutionalize new approaches • The premier’s mandate letter to the Minister of Health and Long-Term Care sets out a number of health-system goals and articulates a commitment to accountability, transparency and quality (88) • The minister’s two recently published action plans articulate a number of health-system goals (6;7) • Cancer Care Ontario and Health Quality Ontario have developed some of the types of expertise required to support many of these elements (either more fully for the cancer-care sector or in a more limited way but across sectors, respectively) • Discussions continue (among the Ontario Ministry of Health and Long-Term Care, the Ontario Primary Care Council and the Physician Provincial Leadership Council, among others) about how to improve access, quality, integration and accountability in the primary-care sector • Discussions also continue about extending and strengthening the role for Local Health Integration Networks, which could play a greater role in supporting the achievement of health-system goals, and about using ‘bundled payments,’ which could extend the use of financial incentives across providers and sectors 		
Element-specific	<ul style="list-style-type: none"> • Capacity exists in many centres and initiatives and in some associations to design and support such efforts 	<ul style="list-style-type: none"> • Capacity exists and tools have been created in many centres and initiatives to support such processes 	<ul style="list-style-type: none"> • Capacity exists at the Institute for Clinical Evaluative Sciences, among other centres, for such monitoring and evaluation

Additional insights into implementation considerations could be derived from case studies of the use of financial incentives, such as those that have been undertaken in select (primarily OECD) countries.(89)

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APPENDICES

The following tables provide detailed information about the overviews of systematic reviews and the systematic reviews identified for each approach element. Each row in a table corresponds to a particular overview or review and the reviews are organized by element (first column) or, in the case of overviews and reviews about financial incentives, by the target of the incentive (citizen, health professional, health organization or a combination). The focus of the overview or review is described in the second column. Key findings from the review that relate to the option are listed in the third column, while the fourth column records the last year the literature was searched as part of the overview or review.

The additional columns are applicable only to systematic reviews (not overviews of systematic reviews).

The fifth column presents a rating of the overall quality of the 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.

The last three columns convey information about the utility of the review in terms of local applicability, applicability concerning prioritized groups, and issue applicability. The third-from-last column notes the proportion of studies that were conducted in Canada, while the second-from-last column shows the proportion of studies included in the review that deal explicitly with one of the prioritized groups. The last column indicates the review’s issue applicability in terms of the proportion of studies focused on optimizing clinical practice.

All of the information provided in the appendix tables was taken into account by the evidence brief’s authors in compiling Tables 4, 5, 7 and 8 in the main text of the brief.

Appendix 1: Systematic reviews and economic evaluations relevant to Element 1 - Support dynamic efforts to identify clinical practices to be optimized and the causes of underlying problems

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
Identify the clinical practice (e.g., inappropriate or low-quality care, negative patient experience, unacceptable/ high cost, poor health outcomes) to be optimized	Development of a checklist for identifying determinants of practice (30)	<p>The review identified 12 checklists focused on identifying determinants of practice, but none were found to be comprehensive as compared to an aggregated list of determinants and domains.</p> <p>The identified checklists were used to develop a single checklist with 57 potential determinants of practice grouped in seven domains: guideline factors, individual health professional factors, patient factors, professional interactions, incentives and resources, capacity for organizational change, and social, political and legal factors.</p> <p>Five worksheets were also developed to facilitate the application of the checklists.</p>	Not reported	4/9 (AMSTAR rating from McMaster Health Forum)	0/12	0/12	12/12
	Development of a method for characterizing and designing behaviour-change interventions (31)	<p>Nineteen frameworks of behaviour-change interventions were identified and used to develop a new framework called the Behaviour Change Wheel. Of the frameworks identified, none assessed the full spectrum of behaviour-change interventions.</p> <p>At the centre of the Behaviour Change Wheel is the 'behaviour system', which consists of three essential conditions: capability, opportunity and motivation. The behaviour change system is encircled by nine interventions that can be used to address deficits in one or more of the elements of the behaviour system, and around these are seven categories of policy that can be used to enable the implementation of these interventions.</p> <p>The Behaviour Change Wheel was successfully used to characterize interventions within the English Department of Health's 2010 tobacco control strategy, and the National Institute of Health and Clinical Excellence's guidance on reducing obesity.</p>	Not stated	6/8 (AMSTAR rating from McMaster Health Forum)	Not applicable – the review included frameworks of behaviour change and not single studies (19 papers describing frameworks were included)	0/19	19/19
	Quality of clinical care in general practice in the U.K., Australia and New Zealand (29)	<p>The majority (85%) of included studies assessed the quality of care provided for chronic conditions, and 12% and 2% examined preventive care and acute conditions, respectively.</p>	1999	8/10 (AMSTAR rating from McMaster)	0/90	0/90	0/90

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>The processes of care in almost of all of the studies did not meet standards of care as outlined in national guidelines or in those set by the investigators.</p> <p>While the review outlines deficiencies in the research, and clinical and policy agendas in general practice, additional work is required to assess the quality of clinical care in a representative sample of the population, identify reasons for sub-standard care, and test strategies to improve the clinical care provided in general practice.</p>		Health Forum)			
Specify who (i.e., what health professional group) needs to do what differently (i.e., what behaviour change)	No reviews identified						
Ascertain the causes of the problem at some or all of five levels (motivation, tasks, roles, rules and strategies)	No reviews identified						
Engage key stakeholders to assess sub-elements 1-3 and identify the appropriate level (e.g., provincial, organizational) at which the problem should be considered (using qualitative or quantitative methods)	Effectiveness of community-engagement approaches and methods for health-promotion interventions (39)	<p>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.</p> <p>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.</p> <p>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)</p>	Not reported (published in 2008)	9/10 (AMSTAR rating from McMaster Health Forum)	4/21	2/21	0/21

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		in areas of cardiovascular health, childhood immunization, injury prevention, sexual health, smoking, alcohol use, nutrition and physical activity.					
	Examining the peer-reviewed empirical evidence on outcomes of public involvement in healthcare policy (90)	<p>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.</p> <p>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.</p> <p>There is limited data available to address the primary research questions.</p> <p>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.</p>	2010	4/9 (AMSTAR rating from McMaster Health Forum)	5/19	0/19	0/19
	Examining the effects of involving patients in the planning and development of healthcare (91)	<p>A review of 337 studies involving patients in the planning and development of healthcare found that few studies described the effects of such involvement. 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.”</p> <p>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.</p> <p>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</p>	2000	5/9 (AMSTAR rating from McMaster Health Forum)	2/40	0/40	0/40

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>and development of services, on the quality and effectiveness of these services across various settings, is unknown.</p>					
	Stakeholder involvement in program evaluation (35)	<p>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. A small percentage of studies report 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.</p> <p>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, <i>Affective Aspects of Involvement and Collaboration, Communication, and Interaction</i>, 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.</p> <p>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.</p>	2010	4/9 (AMSTAR rating from McMaster Health Forum)	Not Reported	0/41	0/41
	Public deliberation as a method for increasing public input for health research (36)	<p>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</p>	2010	1/9 (AMSTAR rating from McMaster Health Forum)	Not reported	Not reported	Not reported

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>include the development of policy direction, recommendations and tools, priority setting and resource allocation, and risk assessments.</p> <p>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.</p>					
Iteratively refine the understanding of the problem as necessary and select an optimal description of the problem, its causes, and the level at which it can most helpfully be considered	No reviews identified						

Appendix 2: Systematic reviews about the effects and acceptability of financial incentives to achieve health-system goals

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
Citizens or patients	Interventions to improve safe and effective medicines use by consumers (40)	<p>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).</p> <p>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 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.</p>	2012	No rating tool available for this type of document	n/a (includes reviews, not single studies)	n/a (includes reviews, not single studies)	75/75 (includes reviews, not single studies)
	Effectiveness of cash or voucher financial incentives for simple and complex health behaviour change in high-income countries (41)	<p>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 (RR 2.48, 95% CI 1.77-3.46), long-term (>6 months) smoking cessation (1.50, 1.05-2.14), vaccination or screening attendance (1.92, 1.46-2.53), and all three complex health behaviors combined (1.62, 1.38-1.91).</p> <p>There was no convincing evidence to suggest differential effects between groups</p>	2012	9/11 (AMSTAR rating from McMaster Health Forum)	0/16	0/16	16/16

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>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.</p> <p>For all behaviours combined, some evidence suggested a decreased effect with increasing post-intervention follow-up and increasing incentive value.</p> <p>Average effect of cash-only financial incentives was greater than for other formats.</p>					
	Effectiveness of financial incentives to achieve sustained changes in smoking, eating, alcohol consumption and physical activity (43)	<p>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 (OR 1.53, 95% CI 1.05-2.23). 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.</p> <p>Financial incentives were found to be effective with smoking cessation rates (effects seen for 12-18 months, sustained for 2-3 months after incentive removal) and healthier eating targets (for 6-12 months, not sustained after incentive removal), but not for physical activity (at 6, 12-18 months and 3 months after incentive removal). High deprivation increased the effect of financial incentives (OR 2.17, 95% CI 1.22-3.85), but only 6-12 months from baseline; other variables did not independently have a significant modifying effect at any follow-up time-point.</p> <p>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.</p>	2012	8/11 (AMSTAR rating from Program in Policy Decision-Making)	0/34	0/34	34/34
	Effectiveness of financial incentives and contingency management programs on long-term smoking	<p>Incentives included lottery tickets, prize draws, cash payments, item vouchers, grocery vouchers, and money deposits. The OR for smoking cessation at longest follow-up was 1.42 (95% CI 1.19-1.69) relative to the control group, and only three studies demonstrated significantly higher quit rates in the incentive group compared to the control.</p>	2014	10/11	0/21	9/21	21/21

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
	cessation rates (44)	<p>In eight of nine trials with data in pregnant smokers, an adjusted OR at longest follow-up (up to 24 weeks post-partum) of 3.60 (2.39-5.43) 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 GBP 400-worth of vouchers, and found rates of 15.4% vs. 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.</p> <p>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.</p>					
	Effectiveness of financial incentives for encouraging healthy behaviours (42)	<p>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.</p> <p>Concerns raised in reference to appropriate providers of HPFI include that many socioeconomically disadvantaged individuals are unwilling to accept federal 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.</p>	2014	6/10 (AMSTAR rating from McMaster's Health Forum Impact Lab)	0/81	0/81	81/81

Using Financial Incentives to Achieve Health-System Goals in Ontario

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		Financial incentive programs that benefit recipients and wider society are likely to be considered more acceptable.					
Health professionals	Incentives for improving human resource outcomes in health care (45)	<p>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.</p> <p>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.</p> <p>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.</p>	2012	No rating tool available for this type of document	n/a (includes reviews, not single studies)	n/a (includes reviews, not single studies)	13/13
	Examining the impact of financial incentives on	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.	2010	No rating tool available for this type	n/a (includes reviews, not single	n/a (includes reviews, not	4/4 (includes reviews, not

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
	healthcare professional behaviour and patient outcomes (46)	<p>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.</p> <p>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.</p>		of document	studies)	single studies)	single studies)
	Effectiveness of pay-for-performance schemes targeting individual healthcare providers for improving quality of patient care and patient-relevant outcomes (47)	<p>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, 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.</p> <p>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 mammographies, and Pap spears and mammographies combined. Other studies found mixed results between significant effects on one outcome and no effect on another.</p> <p>Specific to long-term care and chronic conditions, one highly-ranked RCT 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-forperformance implementation, and no improvements in non-incentivized indicators.</p> <p>While pay-for-performance schemes may be useful in identifying elements of care valued within a given health care 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.</p>	2012	9/10 (AMSTAR rating from McMaster Health Forum)	1/30	0/30	30/30

Using Financial Incentives to Achieve Health-System Goals in Ontario

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
	Effectiveness of behaviour change interventions to encourage generic drug prescriptions in the U.K. National Health Service and similar settings (55)	<p>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.</p> <p>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 (OR 1.22, 95% CI 1.18-1.28, $p < 0.0001$), although a high risk of bias was noted for randomization, allocation concealment and potentially for baseline characteristics, and differences began declining after an additional three months.</p> <p>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.</p>	2013	No rating tool available for this type of document	0/23	0/23	23/23
	Effects of financial incentives on the quality of healthcare provided by primary-care physicians (48)	<p>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.</p> <p>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 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.</p> <p>The review's findings suggested that the following characteristics influenced financial incentive effectiveness: amount and method of payment (salary, fee-for-</p>	2009	10/10 (AMSTAR rating from McMaster Health Forum)	0/7	0/7	7/7

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>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).</p> <p>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.</p>					
	<p>Interventions for supporting nurse retention in rural and remote areas (49)</p>	<p>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.</p> <p>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 health care 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.</p> <p>Overall, while financial incentives were the only strategies that had been evaluated</p>	<p>2012</p>	<p>No rating tool available for this type of document</p>	<p>n/a (includes reviews, not single studies)</p>	<p>n/a (includes reviews, not single studies)</p>	<p>5/5 (includes reviews, not single studies)</p>

Using Financial Incentives to Achieve Health-System Goals in Ontario

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		properly, evidence supporting their effectiveness on long-term nurse retention was still found to be very limited, with some 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 health care workers’ feelings of isolation) were rated as having a combination of moderate-strength indirect evidence and strong direct evidence.					
Organizations	Leaders’ experiences and perceptions implementing activity-based funding and pay-for-performance hospital funding models (50)	<p>All of the included studies focused on leaders’ experiences with implementing organizational incentives, but none clearly described ‘how’ funding models were implemented.</p> <p>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.</p> <p>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 recognize the benefits that can be achieved; and involving physician leaders to support accurate data collection and to act as ‘champions’.</p> <p>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.</p> <p>Improved quality and enhanced organizational transparency were associated with pay-for-performance models.</p>	2013	8/9 (AMSTAR rating from McMaster Health Forum)	0/14	1/14	14/14

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>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).</p> <p>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.</p> <p>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.</p>					
Both health professionals and organizations	Effectiveness of pay-for-performance on clinical efficacy, access and equity, coordination and continuity, patient-centeredness and cost-effectiveness (54)	<p>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 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.</p> <p>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 socioeconomic 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</p>	2009	7/10 (AMSTAR rating from McMaster Health Forum)	2/128	0/128	128/128

Using Financial Incentives to Achieve Health-System Goals in Ontario

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>confirmed by four studies, although health gain findings were varied.</p> <p>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.</p> <p>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.</p>					
	Effects of financial incentives on the clinical quality of individual physicians and provider organizations in the delivery of personal health services (56)	<p>The review identified the available evidence on financial incentives on the clinical quality at both individual-level and organization-level delivery of health services. There is limited evidence to determine the effectiveness of financial incentives among physicians, hospitals and other provider organizations. One study reported a significant improvement in quality scores in hospitals participating in a financial incentive program, when compared to non-participating hospitals. Some studies suggested that financial incentives at both organization level and individual level produced statistically significant quality improvement. Four randomized controlled trials that assessed financial incentives at the individual level, generally found increases in guideline adherence and immunization rates, in addition to improved delivery of cognitive services. There are no direct studies on the impact of quality based on the frequency or duration of financial incentives.</p> <p>Only one study was identified that reported on the cost-effectiveness of a pay-for-performance program, and found that the estimated cost per quality-adjusted life years saved from \$13,000 to \$30,000.</p> <p>A study reported that financial incentives had a positive effect on the structure of care. The study found that reputational incentives and external public reporting</p>	Not reported in detail	No rating tool available for this type of document	Not reported in detail	Not reported in detail	Not reported in detail

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>were associated with significant increased use of organized management practices. No studies were identified that evaluated the effect of external public reporting on clinicians. However, three studies indicated that physicians generally avoided high-risk patients in order to avoid low public ratings.</p> <p>Information technology support may enhance internal capacity to track patient care processes and results.</p> <p>The authors determined that through the available evidence, the structure of incentives that will enable clinical quality would include the following: balance of rewards and penalties; combination of both individual and group-level incentives (with more weighting towards group-level); selective and specific rewards and penalties; comprehensive evidence-based incentives; predominance of absolute performance standards; payoff rules; and long-term and timely payment schedule. Clinically integrated practice may have more added benefit to quality incentives.</p>					
	<p>Effectiveness of existing mechanisms to integrate medical care quality and safety into healthcare pricing and funding arrangements (53)</p>	<p>The literature review identified four healthcare pricing models: best practice pricing, normative pricing, quality structures pricing models and pay-for-performance schemes.</p> <p>For best practice pricing, there are some reported benefits to the approach; however, the studies contained inconsistent methodologies. A study about best practice tariffs found improvements in quality of care (i.e. improved diagnostic assessments and proper medication, decreased lengths of stays). However, the approach has yet to be fully evaluated.</p> <p>For the normative pricing approach, which influences delivery of care, there is limited evidence on its impact on quality and safety of healthcare. Some studies reported improvements in performance among radiologists (i.e. reduced reporting turnaround times) after a financial incentive were added for target performance.</p> <p>For the quality structures pricing approach, which links pricing to structural approaches (i.e. accreditation, clinical quality registries linked to clinical benchmarking, and other safety improvement activities), most of the evidence indicates funding has an impact when clinical services are involved with clinical quality registries linked to clinical benchmarking. The studies reported significant improvements in providers' adherence to evidence-based practices, and reductions in post-surgical complications and mortality. However, there is no evidence to</p>	<p>Not reported in detail</p>	<p>6/10 (AMSTAR rating from McMaster Health Forum)</p>	<p>Not reported in detail – Description states: Canada, Australia, New Zealand, U.S., U.K.</p>	<p>Not reported in detail</p>	<p>Not reported in detail</p>

Using Financial Incentives to Achieve Health-System Goals in Ontario

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>directly link performance and the level of funding; There is limited evidence to support other structural approaches in the improvement of quality and safety in healthcare.</p> <p>For pay-for-performance programs, the literature review reported that there is little evidence on the effect of these programs on patient outcomes, which in most cases was the mortality rate. Hospitals participating in a pay-for-performance program found that mortality remained the same as baseline reports. One study identified adverse effects to pay-for-performance programs, such as increased hospital admissions, cost shifting, cherry picking or misreporting. One study surveyed 66 hospitals and determined that 75% reported making structural and organizational changes (i.e. more involvement and leadership) as a result of an incentive scheme.</p> <p>There is insufficient evidence to conclude which model is the most beneficial. Overall, some conclusions can be made: incentives need to be substantial to generate change in behaviour and practice; incentives need to be provided at a clinical department-level in order to improve quality and safety of clinical care; and further research is needed to expand the literature scope to include outpatients and other departments.</p>					
	Examining result-based financing (RBF) research in the health sector (52)	<p>There are few rigorous studies of pay-for-performance, and overall the evidence of its effects is weak. Financial incentives targeting individual healthcare professionals appear to be effective in the short-run for simple and distinct, well-defined behavioural goals. There is less evidence that financial incentives can sustain long-term changes.</p> <p>Risks associated with results-based financing include: motivating unintended behaviours; ignoring important tasks that are not rewarded with incentives; improving or cheating on reporting rather than improving performance; widening the resource gap between rich and poor; and dependency on financial incentives.</p>	2010	No rating tool available for this type of document	n/a (includes reviews, not single studies)	n/a (includes reviews, not single studies)	10/10
	Effectiveness of incentives and to determine whether additional or modified incentives might be capable of stimulating better adherence to best practice regarding	Ten of the 27 identified reviews evaluated the effectiveness of quality and outcomes frameworks (QOF). Two systematic reviews found statistically significant improvements in intermediate health-target outcomes (i.e. cholesterol, blood pressure, smoking cessation), but decreases after the first year of the implementation of QOF. The review reported that most of the studies found pay-for-performance programs were generally more effective for chronic care than acute care. In general, pay-for-performance programs did not have a negative effect on access. Key features of effective pay-for-performance programs included lower baseline levels, involvement of stakeholders in target selection, and the utilization	2015	No rating tool available for this type of document	0/27	0/27	27/27

McMaster Health Forum

Target	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
	use of medicines and other technologies (51)	<p>of process indicators instead of outcome measures. For pay-for-performance program implementation, there were stronger effects for pay-for-performance programs where new funds were available and where there was sufficient awareness about the elements of the programs. There is no clear association between incentive size and the effectiveness of pay-for-performance programs. Incentives targeted at the individual or team level achieve more positive results than at the hospital level. The majority of the evidence suggests that the QOF is associated with both improved quality of care and patient outcomes. However, further incentive schemes need monitoring and evaluation of their impact.</p> <p>There is little evidence on the effectiveness of non-financial incentives. Among the included studies, positive effects (i.e. improved compliance and performance) were seen in “audit and feedback” programs and peer comparison feedback interventions. There is limited evidence on the effectiveness of manager- and policymaker-driven quality-improvement strategies, and “external accreditation” agencies in improving quality and safety.</p>					

Appendix 3: Systematic reviews and economic evaluations relevant to Element 2 – Use rigorous processes to select and implement approaches to optimizing clinical practices

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
Select candidate strategies and techniques (active ingredients) based on a theoretical framework, research evidence and other inputs, and on an understanding of the issue and context	Effects of local opinion leaders on professional practice and healthcare outcomes (61)	<p>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 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 five randomized controlled trials (RCT) reporting on 40 outcomes).</p> <p>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.</p> <p>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.</p>	2009	10/10 (AMSTAR rating from McMaster Health Forum)	6/18	0/18 (all studies involved clinicians who do not fall under the prioritized group)	18/18
	Effects of continuing education meetings and workshops on professional practice and healthcare outcomes (59)	<p>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.</p> <p>The effects on professional practice and patient outcomes were small and</p>	2006	10/11 (AMSTAR rating from McMaster Health Forum)	4/81	2/81	81/81

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		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.					
	Effects of on-screen, point-of-care computer reminders on processes and outcomes of care (63)	Coordinating the use of genetic testing and related services in B.C. computer reminders led 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	0/28	28/28
	Effectiveness of financial incentives in changing healthcare professional behaviours and patient outcomes (46)	<p>The overview of systematic reviews included four reviews which reported on a total of 32 studies. Two of the reviews scored 7 (i.e., moderate quality) on AMSTAR criteria, and two scored 9 (i.e., high quality), and the quality of included studies was reported to be low to moderate.</p> <p>Payment for working for a specified time period was generally ineffective, improving 3/11 outcomes from one study reported in one review.</p> <p>Payments for each service, episode or visit, providing care for a patient or specific population, and providing a pre-specified level or providing a change in activity or quality of care, were all generally effective.</p> <p>Mixed and other systems were of mixed effectiveness.</p> <p>The effect of financial incentives overall across categories of outcomes were: of mixed effectiveness on consultation or visit rates; generally effective in improving processes of care; generally effective in improving referrals and admissions; generally ineffective in improving compliance with guidelines outcomes; and generally effective in improving prescribing costs outcomes.</p> <p>The authors concluded that financial incentives may be effective in changing healthcare professionals' practices, but did not find evidence that they improve patient outcomes.</p> <p>Financial incentives are utilized as extrinsic sources of motivation and work to provide individuals monetary transfers conditional upon them acting in a certain manner. The authors grouped financial incentives into five different categories: 1) payment for working for a specified time</p>	2010	No rating tool available for this type of document (overview of systematic reviews)	n/a (included systematic reviews as the unit of analysis)	4/4	n/a (included systematic reviews as the unit of analysis)

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		period; 2) payment for each service, episode, or visit; 3) payment for providing care for a patient or specific population; 4) payment for providing a pre-specified level of care or providing a change in activity or quality of care; and 5) mixed or other systems.					
	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 their effectiveness (60)	<p>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.</p> <p>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.</p> <p>Educational-outreach interventions used alone compared to a control group and compared to educational materials were found to be generally effective.</p> <p>There was insufficient evidence for comparisons of multifaceted versus educational meetings, educational outreach visits versus continuity of care, and multifaceted versus reminders.</p> <p>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.</p>	2007	8/11 (AMSTAR rating from www.rxforchange.ca)	1/69	1/69	69/69
	Effects of audit and feedback on professional practice and healthcare outcomes (70)	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	2010	8/11 (AMSTAR rating from www.rxforchange.ca)	11/49	0/49	49/49

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>the effects of audit and feedback on physicians, and some measured the effects on nurses or pharmacists.</p> <p>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.</p> <p>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.</p>					
	<p>Effects of printed educational materials on professional practice and healthcare outcomes (58)</p>	<p>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.</p> <p>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</p>	<p>2011</p>	<p>8/11 (AMSTAR rating from www.rxforchange.ca)</p>	<p>12/50</p>	<p>0/50</p>	<p>50/50</p>

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>outcomes.</p> <p>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: 1) source of information; 2) tailoring; 3) purpose; 4) level of evidence; and 5) format, and that effectiveness may not vary much based on the frequency, mode, or duration of delivery.</p>					
	<p>Guideline dissemination and implementation strategies (92)</p>	<p>86.6% of comparisons reporting dichotomous process data observed improvements in care; however, there was considerable variation in the observed effects both within and across interventions.</p> <p>No relationship was found between the number of component interventions and the effects of multifaceted interventions.</p> <p>Only 29% of studies reported any economic data. Within this subset, the majority of studies only reported costs of treatment, and only 25 studies reported data on the costs of guideline development or guideline dissemination and improvement. Overall, the methods of these economic evaluations and costs analyses were deemed poor. Authors emphasize that policymakers need this information about the costs and benefits of various guideline dissemination and implementation strategies in order to make informed decisions about whether it is worthwhile to introduce guidelines.</p> <p>For single interventions compared with no intervention, reminders, audit and feedback, patient-mediated, and the distribution of educational materials were found to be effective for improving appropriate care with medium effect sizes.</p> <p>Time series data were reported for the distribution of educational materials, and half of the studies showed an immediate effect or effect over time.</p> <p>Insufficient evidence exists for educational meetings, other professional interventions (interviewing physicians about outpatient referrals, and a rapid rule-out protocol), continuity of care, and revision of pharmacy-related professional roles.</p>	<p>1998</p>	<p>7/11 (AMSTAR rating from www.rxforchange.ca)</p>	<p>15/235</p>	<p>1/235 (1 study was set in a military medical clinic)</p>	<p>235/235</p>

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>There is also insufficient evidence on three comparisons of single interventions with another intervention: physicians responding to reminders compared with reminders; educational materials compared with reminders; and reminders compared with patient-mediated interventions.</p> <p>Multifaceted interventions compared with no intervention were found to be effective for improving appropriate care with medium effect sizes. Time series data show that these interventions also have immediate effects, most of which are sustained over time.</p> <p>Multifaceted interventions compared with intervention controls were found to be effective for improving appropriate care with small effect sizes.</p>					
	<p>Effects of tailored interventions to address barriers to change in health professional performance (64)</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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</p>	<p>2009</p>	<p>7/11 (AMSTAR rating from www.rxforchange.ca)</p>	<p>2/26</p>	<p>0/26</p>	<p>26/26</p>

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>(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.</p> <p>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.</p> <p>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.</p>					
Assess how the active ingredients are likely to function (causal mechanisms)	No reviews identified (see overview in Table 5)						
Consider how the active ingredients could be delivered (mode of delivery)	No reviews identified (see overview in Table 5)						
Articulate what the active ingredients aim to change (intended targets)	No reviews identified (see overview in Table 5)						
Engage key stakeholders to assess sub-elements 1-4 and identify barriers and facilitators to the approach (using	See reviews summarized in appendix for the sub-element related to engaging stakeholders						

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
qualitative or quantitative methods)							
Iteratively revise the approach as necessary and select an optimal approach	No reviews identified						
Advocate for, recommend or implement a chosen approach – active ingredients, causal mechanisms, mode of delivery and intended targets – that is appropriate to the issue and context (acceptable, affordable and feasible)	No reviews identified						

Appendix 4: Systematic reviews relevant to Element 3 – Monitor, evaluate and review the approaches selected to optimize clinical practices

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
Monitor the extent of implementation of the active ingredients and their uptake across different modes of delivery	Contextual factors associated with quality-improvement (QI) success (76)	<p>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.</p> <p>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.”</p> <p>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%).</p> <p>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%).</p>	2009	7/10 (AMSTAR rating from McMaster Health Forum)	4/47	0/47	Not reported in detail
	Effectiveness of various quality-improvement strategies for enhancing healthcare (78)	<p>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.</p> <p>Research evidence suggests clinician/patient-driven quality-improvement</p>	2008	2/11 (AMSTAR rating from McMaster Health Forum)	Not reported	0/59	Not reported in detail

McMaster Health Forum

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
		<p>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.</p> <p>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.</p>					
	Effectiveness of quality-improvement collaboratives in enhancing the quality of care (77)	<p>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.</p> <p>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.</p>	2006	4/11 (AMSTAR rating from www.rxforchange.ca)	Not reported in detail	0/72	69/69
(When resources allow) evaluate the impacts of the approach on its intended targets (effectiveness study), its costs and cost-effectiveness, the causal mechanism (process evaluation)	No reviews identified						

Using Financial Incentives to Achieve Health-System Goals in Ontario

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that dealt with the prioritized group	Proportion of studies that focused on achieving health-system goals
and views and experiences of those involved (acceptability study)							
Review the approach based on monitoring and evaluation data to decide whether it should be stopped, modified or scaled up	No reviews identified						
(Where appropriate) commercialize an effective and efficient approach beyond Ontario	No reviews identified						



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