



**Evidence Brief:
Strengthening Primary Healthcare in Canada**

11 May 2009

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 the regional/provincial level 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.

Authors

John N. Lavis, MD PhD, Director, McMaster Health Forum, and Associate Professor and Canada Research Chair in Knowledge Transfer and Exchange, McMaster University

Jennifer Boyko, MHSc, Lead, Evidence Synthesis and Evaluation, McMaster Health Forum

Funding

The evidence brief and the stakeholder dialogue it was prepared to inform were both funded by the Health Council of Canada. The views expressed in the evidence brief are the views of the authors and should not be taken to represent the views of the Health Council of Canada, its Councillors or secretariat, or its principal funder (Health Canada).

John Lavis receives salary support from the Canada Research Chairs Program.

The McMaster Health Forum receives both financial and in-kind support from McMaster University.

Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the evidence brief. The funder 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 researchers, policymakers, and stakeholders in order to ensure its scientific rigour and system relevance.

Acknowledgements

The authors wish to thank Michael Wilson and Jonathan Sachs for assistance with reviewing the research evidence about options, and Nancy Johnson for assistance with writing/editing.

Citation

Lavis JN, Boyko JA. Evidence Brief: Strengthening Primary Healthcare in Canada. Hamilton, Canada: McMaster Health Forum, 11 May 2009.

Product registration numbers

ISSN 1925-2242 (print)

ISSN 1925-2250 (online)

Table of Contents

KEY MESSAGES..... 5

REPORT..... 7

THE PROBLEM..... 8

 Chronic diseases are now a big challenge..... 8

 Access to cost-effective programs, services, or drugs in primary healthcare is not what it could be 9

 Health system arrangements have not always supported the provision of cost-effective programs, services, and drugs 10

 Additional equity-related observations about the problem..... 12

THREE OPTIONS FOR ADDRESSING THE PROBLEM..... 13

 Option 1 - Support the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing/accreditation of their clinics 13

 Option 2 - Support the targeted expansion of inter-professional collaborative practice PHC..... 16

 Option 3 - Support the use of the Chronic Care Model in primary healthcare settings, which means the combination of self-management support, decision support, delivery system design, clinical information systems, health system, and community..... 17

 Additional equity-related observations about the three options 17

IMPLEMENTATION CONSIDERATIONS..... 18

REFERENCES 20

APPENDICES 25

KEY MESSAGES

What's the problem?

- The overarching problem is one of limited or inequitable access to sustainable, high-quality community-based primary healthcare in federal, provincial, and territorial publicly-funded health systems. Key features of the problem include:
 - Chronic diseases now represent a significant share of the common conditions that the primary healthcare system must prevent or treat.
 - Canadians' access to cost-effective programs, services, and drugs is not what it could be, either when they themselves identify the need for care or (more proactively on the part of healthcare providers) when they have an indication or need for prevention or treatment, particularly chronic disease prevention and treatment.
 - Health system arrangements have not always supported the provision of cost-effective programs, services, and drugs. Many Canadians do not have a regular physician or place of care; receive effective chronic-disease management services; or receive care in a primary healthcare practice that uses an electronic health record, faces any financial incentive for quality, or involves a nurse. What is more difficult to determine is the proportion of physicians who receive effective continuing professional development for chronic disease management and the proportion of primary healthcare practices that are periodically audited for their performance in chronic disease management, employ physician-led or collaborative practice models, and adhere to the most holistic primary healthcare model's (the Chronic Care Model's) six features.

What do we know (from systematic reviews) about three viable options to address the problem?

- Option 1 - Support the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing of their primary healthcare practices. We know that:
 - Chronic disease management, electronic health records, physician-level and provider-level financial incentives, and continuing medical education in general and educational meetings in particular improved processes and/or outcomes of care (although the quality of the systematic reviews supporting these statements is mixed).
 - Financial incentives had unintended effects in four studies.
 - Costing studies of electronic health records predicted substantial savings.
- Option 2 - Support the targeted expansion of inter-professional collaborative practice primary healthcare. We know that:
 - Inter-professional collaborative practice teams are associated with positive outcomes for patients/clients, providers, and the system in specialized areas such as mental healthcare and chronic disease prevention and management (although the distinction between effects and associations is not made clear in the systematic reviews supporting these statements).
 - Community mental health teams reduced dissatisfaction with services, hospital admission rates, and deaths by suicide but had no effect on admittance to emergency services, contact with primary healthcare, and contact with social services.
 - Cost savings have been observed with inter-professional collaborative practice teams in some primary healthcare settings, such as decreased average provider and patient costs for blood pressure control and lower readmission rates for team-managed, home-based primary healthcare.
- Option 3 - Support the use of the Chronic Care Model (CCM) in primary healthcare settings, which means the combination of self-management support, decision support, delivery system design, clinical information systems, health system, and community. We know that:
 - Incorporating most or all of the CCM improved quality of care and outcomes for patients with various chronic illnesses, and incorporating one or more elements of the CCM improved processes of care and clinical outcomes for patients with asthma, congestive heart failure, depression, and diabetes (although the quality of both systematic reviews supporting these statements is low).

What implementation considerations need to be kept in mind?

- Little empirical research evidence about implementation barriers and strategies could be identified.

REPORT

Primary healthcare includes first-contact services delivered by a range of providers. Most commonly in Canada these providers are general practitioners and family physicians. However, increasingly these providers can also include nurse practitioners, pharmacists, and telephone advice lines, among others. Primary healthcare also serves a co-ordination function to ensure continuity of care as patients seek more specialized services within the health system. Health Canada defines the list of primary healthcare services as potentially including:

“1) prevention and treatment of common diseases and injuries; 2) basic emergency services; 3) referrals to/coordination with other levels of care (such as hospitals and specialist care); 4) primary mental healthcare; 5) palliative and end-of-life care; 6) health promotion; 7) healthy child development; 8) primary maternity care; and 9) rehabilitation services.”(1)

However, whether any given service is defined as a primary healthcare service per se, or as a service “co-ordinated” by primary healthcare providers, can vary by jurisdiction and even by organization within a jurisdiction.

Primary healthcare has been the focus of renewed interest over the last decade.(2) Despite this renewed interest, questions continue to be asked about limitations or inequities in access to sustainable, high-quality community-based primary healthcare in federal, provincial, and territorial publicly-funded health systems. This evidence brief reviews the research evidence about this issue, three options for addressing it, and key implementation considerations.

The key features of the policy and system context for this evidence brief are as follows:

- Canada’s provincial and territorial publicly funded health systems are distinguished by a private delivery /public payment “bargain” with hospitals and physicians;
- the bargain with physicians has historically meant that most primary healthcare is delivered by physicians working in private practice with first-dollar, public (typically fee-for-service) payment;
- other healthcare providers (such as nurses and psychologists), and teams led by other healthcare providers, are typically not eligible for public payment – or at least not on terms that make independent primary healthcare practices viable on a large scale;

Box 1: Background to the evidence brief

This evidence brief mobilizes both global and local research evidence about a problem, three options for 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.

The preparation of the evidence brief involved five steps:

- 1) convening a Steering Committee comprised of representatives from the funder 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 viable options for addressing it, in consultation with the Steering Committee and a number of 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, options, 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 options for addressing the problem were not designed to be mutually exclusive. They could be pursued simultaneously or elements could be drawn from each option to create a new (fourth) option.

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.

- similarly, for many Canadians, prescription drugs and homecare services are not eligible for public payment and, if they are eligible, it is not with the same type of first-dollar coverage provided for hospital-based and physician-provided care;
- the private practice element of the core bargain has typically meant that physicians have been wary of potential infringements on their professional and commercial autonomy (e.g., directives about the nature of the care they deliver or the way in which they organize and deliver that care); and
- Canada's federal government's direct role in health-services delivery is primarily focused on First Nations and Inuit populations, many of whom also obtain care through provincial and territorial systems.(3)

THE PROBLEM

The problem being addressed here is a large one: limited or inequitable access to sustainable, high-quality community-based primary healthcare in federal, provincial, and territorial publicly-funded health systems. The problem can be understood at several levels: 1) the nature and burden of common diseases and injuries that the primary healthcare system must prevent or treat; 2) access to the cost-effective programs, services, and drugs that primary healthcare systems must deliver or prescribe; and 3) the health system arrangements that determine access to and use of cost-effective programs, services, and drugs.

Chronic diseases are now a big challenge

While a number of the common diseases and injuries that the primary healthcare system must prevent or treat remain acute or episodic in nature, chronic diseases are now a big challenge confronting those working in primary healthcare systems. To illustrate the point, consider the following observations made using data collected as part of the Canadian Community Health Survey (CCHS) in 2005:

- 33% of Canadians 12 years of age and older reported having at least one chronic health condition, meaning (in this case) at least one of arthritis, cancer, chronic obstructive lung disease, diabetes, heart disease, high blood pressure, and mood disorders;
- the proportion of Canadians with chronic health conditions increases with increasing age: 13% of adults aged 20-39 reported having one or more of these conditions, whereas this increases to 71% of adults 60-79 years of age and to 82% of adults 80 years of age and older;
- arthritis (16%) and high blood pressure (15%) are the most common of these conditions among Canadians

Box 2: Equity considerations

A problem may disproportionately affect some groups in society. The benefits, harms, and costs of options 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 Canadians, but (where possible) it also gives particular attention to three groups:

- elderly citizens, particularly those living with multiple chronic diseases;
- Aboriginal populations (i.e., First Nations, Inuit, and Métis populations); and
- people living with mental illness. 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.)

overall, while diabetes, heart disease, and mood disorders are less common but still reported by 5% to 6% of Canadians; and

- more than one third of those with a single select chronic health condition reported moderate or severe disability (36%) and half of those with two or more conditions reported moderate or severe disability (51%).(4)

Moreover, risk factors for chronic diseases foreshadow continued challenges ahead. Selecting just one example, according to the Organisation for Economic Co-operation and Development (OECD), the obesity rate in Canada was 18% in 2005. Although this rate was lower than the rates in the United Kingdom (24% in 2006) and the United States (34% in 2006), it was higher than in most other OECD countries. These data suggest that obesity-related chronic diseases (asthma, cardiovascular disease, and diabetes) will grow in prevalence in the years ahead.(5)

People with chronic health conditions use healthcare services more often and more intensively than do those without, and the intensity of service use increases as the numbers of conditions go up. For example, the 33% of Canadians with one or more of the seven chronic conditions listed above account for approximately 51% of general practitioner/family physician consultations and 66% of nursing consultations.(6) Compared to people with none of the seven chronic conditions, people with a single chronic condition consulted with a general practitioner/family physician 1.5 times as often and with a nurse almost 2.5 times as often, and those with three or more of the chronic health conditions consulted with a general practitioner/family physician twice as often and with a nurse four times as often.(4) The latter group – those with three or more of the chronic health conditions – account for 4% of the population but 9% of general practitioner/family physician consultations.(4) Among those with a single chronic health condition, people with mood disorders or cancer consulted with general practitioner/family physician more often than did those with other chronic health conditions.(4)

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. Published literature that provided a comparative dimension to an understanding of the problem was sought using three health services research “hedges” 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 Canadian and international organizations, such as the Canadian Institute for Health Information, Health Council of Canada, European Observatory on Health Systems and Policies, Health Evidence Network, and Organisation for Economic Co-operation and Development.

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

Access to cost-effective programs, services, or drugs in primary healthcare is not what it could be

One category of measure of access to primary healthcare is whether Canadians can readily access programs, services, and drugs when they themselves identify the need for care. Recent examples of access challenges experienced by a broad cross-section of Canadians include:

- one quarter (24%) of Canadians needing immediate care for a minor health problem reported having trouble accessing it, with the top reasons including waiting too long in the office and waiting too long for an appointment;
- one fifth (20%) of Canadians needing routine or ongoing care reported having trouble accessing it, with the top reasons including waiting too long for an appointment and difficulty getting an appointment; and
- one quarter (24%) of Canadians reported visiting an emergency department at least once in the past 12 months and more than one third (39%) of this group reported believing their visit to emergency was for a

condition that could have been treated by their primary care provider if the provider had been available.(7)

Turning now to adults with chronic conditions:

- 10% of adults with chronic conditions reported that there was a time in the previous year when they needed health care but did not get it;
- adults with chronic conditions reported having difficulty accessing immediate care (21%) or routine or ongoing care (20%), with the top reason for the latter reported as waiting too long for an appointment; and
- one third (33%) of adults with chronic conditions who visited an emergency department in the last 12 months reported that their last visit was for a condition that could have been treated by their primary care provider if the provider had been available.(8)

A second category of measure of access to primary healthcare is whether Canadians are proactively offered cost-effective programs, services, and drugs when they have an indication or need for prevention or treatment, particularly chronic disease prevention and treatment. Here the research evidence is more sparse. As one example, at least one in five Canadian adults who visited their doctor within the last 12 months said their primary healthcare provider always discussed ways to improve their health or prevent disease, whereas an equal proportion said their provider rarely or never did so.(7)

A comparison of provincial health plan billing data to survey data found that rates of influenza vaccination (among those aged 12 and older), mammography (among women aged 35 and older), and Papanicolaou smear (among women aged 18 or older) were lower in provincial health plan billing data.(9) This finding suggests that the above self-reported data could underestimate access problems.

Health system arrangements have not always supported the provision of cost-effective programs, services, and drugs

In Canada's current primary healthcare system, access to a physician can in turn determine access to and use of a range of cost-effective programs, services, and drugs. In 2007 most (but far from all) Canadians reported having a regular physician (84%) or place of care (7%).(10) Of the other countries included in the international survey, namely Australia, Germany, the Netherlands, New Zealand, the United Kingdom, and the United States, it was only in the United States where the proportion of citizens who reported having a regular physician (80%) was lower than the proportion in Canada.(10) The story is marginally better for adults with chronic conditions. In 2008, 92% reported having a regular physician and 5% reported having a regular place of care. Sixty-six percent of those with a regular physician or place of care reported having been affiliated with this primary healthcare provider for more than five years.(11) Only Australia (89%) and the United States (82%) witnessed a lower proportion of adults with chronic conditions who reported having a regular physician.(11)

Estimating the proportion of Canadians who have access to and use a broad range of chronic-disease management programs and services can be difficult. To illustrate the problem, however, consider the case of diabetes, for which four services would ideally be provided to adults with the condition. In Canada in 2008, only 39% of adult diabetic patients reported receiving all four services. This percentage is well below the percentages in New Zealand (55%), the Netherlands (59%), and the United Kingdom (67%).(11)

In Canada in 2007 only 23% of primary healthcare practices had electronic health records, which contrasts starkly with Australia (79%), the United Kingdom (89%), New Zealand (92%), and the Netherlands (98%).(10) That same year, only 5% of Canadians with a "medical home" (defined as having a regular physician or place of care that is easy to contact, knows the patient's medical history, and helps co-ordinate

care) reported being able to access their medical records by computer (including the internet), whereas 43% reported that they would like to do so.(11) Of six comparator countries, Germany had the highest proportion of patients being able to access medical records by computer (18%).(11)

In the same year, 41% of primary healthcare practices faced any financial incentive for quality, which was lower than the six comparator countries participating in the international survey, and much lower than one of the six countries – the United Kingdom (95%).(10) Other data about primary healthcare practices can be more difficult to identify, particularly for comparative purposes, such as the proportion of physicians who receive effective continuing professional development for chronic disease management or the proportion of primary healthcare practices that are periodically audited for their performance in chronic disease management.

Regarding access to an interdisciplinary primary healthcare team, 22% of Canadians with chronic conditions reported in 2008 that a nurse was regularly involved in managing their condition, which was higher than in Germany (13%) or Australia (18%) but lower than in France (26%), the Netherlands (29%), New Zealand (33%), the United States (33%), and the United Kingdom (48%).(11) A much higher proportion of Canadians with chronic conditions (49%) reported in the same year that a nurse provided them with support or counselling by telephone, which compared favourably to all other countries that participated in the international survey. Unfortunately the survey did not address the extent to which these primary healthcare practices employed physician-led or collaborative practice models or Canadians' interactions with a fuller array of other potential primary healthcare team members.

Turning now to access to primary healthcare practices that follow the most holistic primary healthcare model available to proactively support access to and use of a range of cost-effective programs, services, and drugs (the Chronic Care Model), little research evidence is available about the proportion of primary healthcare practices that adhere to the model's six features:

- self-management support (i.e., empowering and preparing patients to manage their health and health care);
- decision support (i.e., promoting clinical care that is consistent with scientific evidence and patient preferences through, for example, embedding evidence-based guidelines into daily clinical practice and supporting their implementation through continuing professional development);
- delivery system design (i.e., assuring the proactive, culturally sensitive delivery of effective, efficient clinical care and self-management support by inter-professional teams);
- clinical information systems (i.e., organizing patient and population data to facilitate effective, efficient care through, for example, an electronic health record that supports timely reminders for providers and patients and the monitoring of the performance of primary healthcare teams and the system in which they work);
- health system (i.e., creating a culture, organization, and mechanisms that promote safe, high quality care, which can include visible supporting comprehensive system change that moves beyond “silos” for acute care, primary healthcare, public health, home care, and mental healthcare); and
- community (i.e., mobilizing community resources to meet the needs of patients even though these resources are not formally part of healthcare systems).(12;13)

A recently published report of four Canadian case studies of effective management of chronic disease using primary healthcare teams found that none of the cases embraced all features of the model.(14) However, the case-selection process did not involve developing an inventory of Canadian primary healthcare practices that had adopted select features of the model and the case studies did not include an explicit assessment of the cases against the model.

Select research evidence is available about aspects of some of the model's features. For example, in 2007, only 40% of Canadians with chronic conditions reported receiving reminders when they were due for preventive care or follow-up care for their condition, with this proportion dropping to 29% for those without a “medical

home.”(15) This proportion was lower than any of the six comparator countries and much lower than in the United States (70%).(15)

Additional equity-related observations about the problem

As this research evidence suggests, some features of the problem can be described for those with multiple chronic diseases and, more rarely, for elderly citizens with multiple chronic diseases, including some of the contributions that health system arrangements make to the problem. While mental illness was among those chronic conditions examined in some of the studies described above, research evidence (particularly comparative studies) about key health system arrangements could not be identified for those with mental illness. By far the biggest challenge was obtaining research evidence about the particular manifestation of the problem among Aboriginal populations (i.e., First Nations, Inuit, and Métis populations). Data from the most recently conducted Aboriginal Peoples Survey was released in Fall 2008, however, we were unable to identify any studies that have used the data to address the problem at hand. Neither this survey nor its predecessor (completed in 2001) examined the contribution of key health system arrangements to the problem.

THREE OPTIONS FOR ADDRESSING THE PROBLEM

Many options could be selected to address the problem of limited or inequitable access to sustainable, high-quality community-based primary healthcare in federal, provincial, and territorial publicly-funded health systems. To promote discussion about the pros and cons of potentially viable options, three have been selected for more in-depth review. They range from:

- 1) building on the strong base of physician-led primary healthcare by supporting the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing of their primary healthcare practices;
- 2) building on promising pilot team-based models of primary healthcare by supporting the targeted expansion of inter-professional collaborative practice; and
- 3) undertaking a major series of reforms to support the use of the Chronic Care Model in primary healthcare settings, which means a combination of strategies focused on self-management support, decision support, delivery system design, clinical information systems, the health system, and the community.

The focus here is on what is known about these options. In the next section the focus turns to the barriers to adopting and implementing these options and to possible implementation strategies to address the barriers.

Option 1 - Support the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing/accreditation of their clinics

This option has a number of elements, including:

- increasing the proportion of patients who have a regular primary care physician;
- increasing the proportion of primary care physicians involved in a physician-led team;
- increasing the proportion of primary care physicians offering an array of chronic disease management programs and services;
- increasing the proportion of primary care physicians using electronic health records to support chronic disease management programs and services;
- increasing the proportion of physicians who receive target payments for chronic disease management programs and services;

Box 4: Mobilizing research evidence about options for addressing the problem

The available research evidence about options for addressing the problem was sought primarily from a continuously updated database containing more than 800 systematic reviews of governance, financial, and delivery arrangements within health systems: the Program in Policy Decision-Making (PPD) / Canadian Cochrane Network and Centre (CCNC) database. The reviews were identified by first searching the database for reviews containing primary healthcare-related keywords in the title and/or abstract. The keywords include primary care, primary health*/primary health care, community care, community health*/community health care, and outpatient/out-patient/out patient. Additional reviews were identified by searching the database for reviews addressing features of the options that were not identified using primary healthcare-related keywords.

The authors' conclusions were extracted from these reviews whenever possible. Some reviews contained no studies despite an exhaustive search (i.e., they were "empty" reviews), while others concluded that there was substantial uncertainty about the option based on the identified studies. Where relevant, caveats were introduced about these authors' conclusions based on assessments of the reviews' quality, the local applicability of the reviews' findings, equity considerations, and relevancy to the issue. (See 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 review, substantial uncertainty or concerns about quality, local applicability, or a lack of attention to equity considerations, primary research could be commissioned or an option could be pursued and a monitoring and evaluation plan designed as part of its implementation. When faced with a 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 systematic review. Those interested in pursuing a particular option may want to search for a more detailed description of the option or for additional research evidence about the option.

- increasing the proportion of physicians who receive effective continuing professional development for chronic disease management; and
- increasing the proportion of physicians whose primary healthcare practices are periodically audited/accredited for quality chronic disease management.

Synthesized research evidence is available about a number of strategies that address these elements of the option. A summary of authors' conclusions from this synthesized research evidence is provided in Table 1 (or obtain citations for the reviews). For those who want to know more about the systematic reviews contained in Table 1 (or obtain the citation for the reviews), a fuller description of the systematic reviews is provided in Appendix 1.

Table 1: Summary of key findings from systematic reviews relevant to Option 1- Support the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing/accreditation of their clinics

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Introduction of a telephone triage and advice line reduced the workload of physicians (which could allow them to take on additional patients). • Chronic disease management improved processes of care and disease control. • Diabetes disease management programs improved glycemic control and increased screening for retinopathy and foot complications. • Electronic health records in the outpatient primary healthcare setting improved provider and patient compliance with screening interventions and active problem treatment rates. • Electronic health records that make available clinical information management and decision support tools (particularly those that translate data into context-specific information) improved provider performance. • Physician-level financial incentives had partial or positive effects on measures of quality in five of six studies and provider-level financial incentives had similar effects in seven of nine studies. • Continuing medical education achieved and maintained objectives related to physician knowledge, attitudes, and practice behaviour, as well as longer-term clinical outcomes. • 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. • Multi-faceted strategies (including continuing professional development) targeted at physicians (and nurses and pharmacists) improved diabetes management in primary healthcare in both outpatient and community settings. • Audit was associated with improved patient care, however, it was generally done by more developed practices, on subjects easier to audit, and the effects stop when emphasis shifts to other priorities.
Potential harms	<ul style="list-style-type: none"> • Financial incentives had unintended effects in four studies.
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> • Costing studies of electronic health records predicted substantial savings.
Uncertainty regarding benefits and potential harms or risk (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"> ○ Effects of involving physicians in physician-led teams • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Effects of strategies to increase the proportion of healthcare professionals practicing in rural and other underserved areas ○ Optimal duration of financial incentives or the persistence of their effects after termination ○ Effects of performance-based payment for prescription drug prescribing • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ No conclusive evidence about the effects of chronic disease management on direct medical costs ○ Pay-for-performance yielded no effects in all but two well-designed studies and positive findings in two well-designed studies.
Key elements of the policy option if it was tried elsewhere	<ul style="list-style-type: none"> • No systematic reviews were identified
Stakeholders' views and experiences	<ul style="list-style-type: none"> • No systematic reviews were identified

Option 2 - Support the targeted expansion of inter-professional collaborative practice PHC

This option is more straightforward than Option 1 in having only one major element: supporting the targeted expansion of inter-professional collaborative practice primary healthcare. The targeting could be on the basis of the health professionals and lay workers included in the model (or the scope of practice they are given within the model), the nature of the programs and services covered (e.g., health promotion and disease prevention versus acute care, mental health versus other types of care) or the target populations (e.g., elderly citizens, Aboriginal populations, or people living with mental illness), as well as guided by a value-for-money orientation.

Synthesized research evidence is available about a number of types of teams, including inter-professional collaborative practice primary healthcare. A summary of the review authors' key findings is provided in Table 2. For those who want to know more about the systematic reviews contained in Table 2 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 2. Synthesized research evidence is also available about (typically the effects of) using particular health professionals or lay workers to provide healthcare, some of which may be relevant to team design. These groups include nurses,(36-39) nurse practitioners,(44;41), pharmacists,(42;43) mental health workers,(44;45) community health workers,(46-48) and lay health workers.(49)

Table 2: Summary of key findings from systematic reviews relevant to Option 2 - Support the targeted expansion of inter-professional collaborative practice PHC

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Inter-professional collaborative practice teams are associated with positive outcomes for patients/clients, providers, and the system in specialized areas such as mental healthcare and chronic disease prevention and management. • Community mental health teams reduced dissatisfaction with services, hospital admission rates, and deaths by suicide but had no effect on admittance to emergency services, contact with primary healthcare, and contact with social services. • Interventions designed to improve doctor/nurse collaboration improved select processes of care but not outcomes (however, no studies were conducted in primary healthcare settings).
Potential harms	<ul style="list-style-type: none"> • Not applicable
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> • Cost savings have been observed with inter-professional collaborative practice teams in some primary healthcare settings, such as decreased average provider and patient costs for blood pressure control and lower readmission rates for team-managed, home-based primary healthcare.
Uncertainty regarding benefits and potential harms or risk (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"> ○ Not applicable • 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"> ○ Studies do not identify how variation among inter-professional collaborative practice models affect outcomes.
Key elements of the policy option if it was tried elsewhere	<ul style="list-style-type: none"> • The type and diversity of clinical expertise involved in team decision-making largely accounts for improvements in patient care and organizational effectiveness. Collaboration, conflict resolution, participation, and cohesion are most likely to influence staff satisfaction and perceived team effectiveness. • Team structure (which includes team premises, team size and composition, and organizational support) and team processes (team meetings, clear goals and objectives, and audit) had an impact on inter-professional team-working.
Stakeholders' views and experiences	<ul style="list-style-type: none"> • No systematic reviews were identified.

Option 3 - Support the use of the Chronic Care Model in primary healthcare settings, which means the combination of self-management support, decision support, delivery system design, clinical information systems, health system, and community

On the one hand, this option has only one major element: use of the Chronic Care Model. On the other hand, by definition it includes the six elements of the Chronic Care Model, each of which arguably includes a number of sub-elements.

Synthesized research evidence is available about the effects of using the Chronic Care Model in whole or in part. A summary of the key findings from this synthesized research evidence is provided in Table 3. For those who want to know more about the systematic reviews contained in Table 3 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 3. Synthesized research evidence is also available about (typically the effects of) many of the Chronic Care Model’s sub-elements, including self-management support,(55) decision support,(58) delivery system design,(57) clinical information systems,(58) and the health system.(59)

Table 3: Summary of key findings from systematic reviews relevant to Option 3 - Support the use of the Chronic Care Model in primary healthcare settings, which means the combination of self-management support, decision support, delivery system design, clinical information systems, health system, and community

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Incorporating most or all of the Chronic Care Model improved quality of care and outcomes for patients with various chronic illnesses. • Incorporating one or more elements of the Chronic Care Model improved processes of care and clinical outcomes for patients with asthma, congestive heart failure, depression, and diabetes.
Potential harms	<ul style="list-style-type: none"> • Not applicable
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> • Not applicable
Uncertainty regarding benefits and potential harms or risk (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"> ○ Not applicable • 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 elements of the policy option if it was tried elsewhere	<ul style="list-style-type: none"> • Not applicable
Stakeholders’ views and experiences	<ul style="list-style-type: none"> • Not applicable

Additional equity-related observations about the three options

As this research evidence suggests, some of what is known about the three options is specific to patients with multiple chronic diseases, albeit not for elderly citizens with multiple chronic diseases. While mental illness was among those chronic conditions examined in some of the systematic reviews described above, systematic reviews about some options or elements of options did not address those with mental illness. By far the biggest challenge was obtaining systematic reviews that addressed options among Aboriginal populations. One notable exception was a review of specialist outreach clinics.(59;62) A systematic review

of strategies that could improve the quality of healthcare for ethnic minority populations concluded that, while there are some promising strategies (such as provider reminder systems for the provision of standardized services), there is a lack of studies specifically targeting diseases and processes of care for which disparities had previously been documented.(63; AMSTAR (quality) rating = 8/11) Also, a systematic review of recent innovations in service provision to improve access to primary healthcare in the United Kingdom lamented the lack of planned, well designed evaluations that are commissioned at the same time that innovations are introduced.(64)

IMPLEMENTATION CONSIDERATIONS

Little empirical research evidence about implementation barriers and strategies could be identified. A preliminary assessment of potential barriers is provided in Table 4, however, these and other potential barriers warrant further study in their own right.

Table 4: Potential barriers to implementing the options

Levels	Option 1 – Support the expansion of chronic disease management in physician-led care	Option 2 – Support the targeted expansion of inter-professional collaborative practice primary healthcare	Option 3 – Support the use of the Chronic Care Model in primary healthcare settings
Patient/ individual		Some patients’ initial wariness of potential disruptions in their relationship with their primary healthcare physician(65)	AMSTAR (quality) rating for (65)= 6/11 Patients’ initial wariness of potential disruptions in their relationship with their primary healthcare physician(65)
Care provider	Physicians’ (particularly older physicians’) wariness of potential infringements on their professional and commercial autonomy, in light of the private delivery part of the “private delivery / public payment bargain” with physicians (3;66)		Physicians’ (particularly older physicians’) wariness of potential infringements on their professional and commercial autonomy, in light of the private delivery part of the “private delivery / public payment bargain” with physicians (3;66)
Organization		Organizational scale is not viable in many rural and remote communities	Organizational scale is not viable in many rural and remote communities
System		Governments’ willingness to extend public payment to other healthcare providers and teams while maintaining public payment to physicians in light of the public payment part of the “private delivery / public payment bargain” with physicians, particularly during a recession(3;66)	Governments’ willingness to broaden the breadth and depth of public payment for primary healthcare, particularly during a recession

One possible implementation strategy would be to support multi-stakeholder regional collaborations in much the same way that many provincial governments have supported the development of alternative funding plans in academic health science centres. Regions that were able to successfully broker a new model of primary healthcare delivery could apply for funding to implement the model. Collaborative primary health care models are emerging in Ontario, Saskatchewan, Newfoundland, and Labrador, Alberta, and Québec (8;67;68). A second possible implementation strategy, which is more research-driven than the politics-driven first strategy, would be to support a second iteration of the Primary Health Care Transition Fund, but this time with the focus on large-scale, multi-site impact evaluations.(69;70) Coalitions of stakeholders and researchers

that were able to successfully broker an evaluation framework for a new model of primary healthcare delivery could apply for funding to implement and evaluate the model. No research evidence could be found to establish the benefits, harms, and costs of these (or other) implementation strategies.

REFERENCES

1. Health Canada. *About Primary Health Care*. Ottawa, Canada: Health Canada; 2006.
2. Romanow RJ. *Building on Values: The Future of Health Care in Canada*. Saskatoon, Canada: Commission on the Future of Health Care in Canada; 2002.
3. Lavis JN. Political elites and their influence on health care reform in Canada. In: McIntoch T, Forest P-G, Marchildon GP, eds. *The Governance of Health Care in Canada*. Toronto, Canada: University of Toronto Press Incorporated; 2004. p. 257-79.
4. Health Council of Canada. *Population Patterns of Chronic Health Conditions in Canada*. Toronto, Canada: Health Council of Canada; 2007.
5. Organisation for Economic Co-operation and Development. *Briefing Note for OECD Health Data 2008: How Does Canada Compare*. Paris, France: Organisation for Economic Co-operation and Development; 2008.
6. Broemeling AM, Watson DE, Prebtani F. Population patterns of chronic health conditions, comorbidity and healthcare use in Canada: Implications for policy and practice. *Healthcare Quarterly* 2008;11(3):70-6.
7. Health Council of Canada. *Fixing the Foundation: An Update on Primary Health Care and Home Care Renewal in Canada*. Toronto, Canada: Health Council of Canada; 2008.
8. Health Council of Canada. *Canadians' Experiences with Chronic Illness Care in 2007*. Toronto, Canada: Health Council of Canada; 2007.
9. Wang L, Nie JX, Upshur REG. Determining use of preventive health care in Ontario. *Canadian Family Physician* 2009;55(2):178.
10. Schoen C, Osborn R, Doty MM, Bishop M, Peugh J, Murukutla N. Toward higher-performance health systems: adults' health care experiences in seven countries, 2007. *Health Affairs* 2007;26(6):w717-w734.
11. Schoen C, Osborn R, How SKH, Doty MM, Peugh J. In chronic condition: Experiences of patients with complex health care needs, in eight countries, 2008. *Health Affairs* 2008;28(1):w1-w16.
12. Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *The Milbank Quarterly* 1996;74(4):511-44.
13. The Robert Wood Johnson Foundation. *The Chronic Care Model*. Princeton, USA: Improving Chronic Illness Care; 2009.
14. Health Council of Canada. *Getting It Right: Case Studies of Effective Management of Chronic Disease Using Primary Health Care Teams*. Toronto, Canada: Health Council of Canada; 2009.
15. Schoen C, Osborn R, Doty MM, Bishop M, Peugh J, Murukutla N. Toward higher-performance health systems: adults' health care experiences in seven countries, 2007. *Health Affairs* 2007;26(6):w717-w734.
16. Grobler LA, Marais BJ, Mabunda SA, Marindi PN, Reuter H, Volmink J. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. *Cochrane Database of Systematic Reviews* 2009;(2): CD005314.

17. Leibowitz R, Day S, Dunt D. A systematic review of the effect of different models of after-hours primary medical care services on clinical outcome, medical workload, and patient and GP satisfaction. *Family Practice* 2003;20(3):311-7.
18. Roberts E, Mays N. Can primary care and community-based models of emergency care substitute for the hospital accident and emergency (A & E) department? *Health Policy* 1998;44(3):191-214.
19. Wilson AD, Childs S. Effects of interventions aimed at changing the length of primary care physicians' consultation. *Cochrane Database of Systematic Reviews* 2006;(1):CD003540.
20. Mattke S, Seid M, Ma S. Evidence for the effect of disease management: Is \$1 billion a year a good investment? *American Journal of Managed Care* 2007;13(11):670-6.
21. Jones A, Fay JK. Primary care based clinics for asthma. *Cochrane Database of Systematic Reviews* 2002;(2):CD003533.
22. Knight K, Badamgarav E, Henning JM, Hasselbald V, Gano AD, Ofman JJ et al. A systematic review of diabetes disease management programs. *American Journal of Managed Care* 2005;11(4):242-50.
23. Jerant AF, Hill DB. Does the use of electronic medical records improve surrogate patient outcomes in outpatient settings? *Journal of Family Practice* 2000;49(4):349-57.
24. Shekelle PG, Morton SC, Keeler EB. *Costs and Benefits of Health Information Technology*. Rockville, USA: Agency for Healthcare Research and Quality, Publication No. 06-E006; 2006.
25. Petersen LA, Woodard LD, Urech T, Daw C, Sookanan S. Does pay-for-performance improve the quality of health care? *Annals of Internal Medicine* 2006;145(4):265-72.
26. Rosenthal MB, Frank RG. What is the empirical basis for paying for quality in health care? *Medical Care Research and Review* 2006;63(2):135-57.
27. Sturm H, Austvoll-Dahlgren A, Aaserud M, Oxman AD, Ramsay C, Vernby A et al. Pharmaceutical policies: effects of financial incentives for prescribers. *Cochrane Database of Systematic Reviews* 2007;(3):CD006731.
28. Giuffrida A, Gosden T, Forland F, Kristiansen IS, Sergison M, Leese B et al. Target payments in primary care: effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 2000;(3): CD000531.
29. Gosden T, Forland F, Kristiansen IS, Sutton M, Leese B, Giuffrida A et al. Impact of payment method on behaviour of primary care physicians: a systematic review. *Journal of Health Services & Research Policy* 2001;6(1):44-55.
30. Chaix-Couturier C, Durand-Zaleski I, Jolly D, Durieux P. Effects of financial incentives on medical practice: results from a systematic review of the literature and methodological issues. *International Journal for Quality in Health Care* 2000;12(2):133-42.
31. Oxman A, Fretheim A. *Can Paying for Results Help to Achieve the MDGs? 1. An Overview of the Effectiveness of Results-based Financing*. Oslo, Norway: Norwegian Knowledge Centre for the Health Services; 2008.
32. Marinopoulos SS, Dorman T, Ratanawongsa N, Wilson LM, Ashar BH, Magaziner JL et al. Effectiveness of continuing medical education. *Evidence Report/Technology Assessment* 2007(149):1-69.

33. Forestlund L, Bjørndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 2009;(2):CD003030.
34. Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT, Assendelft WJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *Cochrane Database of Systematic Reviews* 2000;(4):CD001481.
35. Holden J. Systematic review of published multi-practice audits from British general practice. *Journal of Evaluation in Clinical Practice* 2004;10:247-72.
36. Oakeshott P, Kerry S, Austin A, Cappuccio F. Is there a role for nurse-led blood pressure management in primary care. *Family Practice* 2003;20:469-73.
37. Laurant M, Reeves D, Hermens R, Braspenning J, Grol R, Sibbald B. Substitution of doctors by nurses in primary care. *Cochrane Database of Systematic Reviews* 2004;(4):CD001271.
38. Connock M, Taylor R. *Local Nurse Telephone Triage in Primary Care*. Birmingham, United Kingdom: Birmingham Technology Assessment Group; 2003.
39. Kennedy C, Christie J, Harbison J, Maxton F, Rutherford I, Moss D. Establishing the contribution of nursing in the community to the health of the people of Scotland: integrative literature review. *Journal of Advanced Nursing* 2008;64(5):416-39.
40. Brown SA, Grimes DE. A meta-analysis of nurse practitioners and nurse midwives in primary care. *Nursing Research* 1995;44(6):332-9.
41. Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *British Medical Journal* 2002;324(7341):819-23.
42. Beney J, Bero LA, Bond C. Expanding the roles of outpatient pharmacists: effects on health services utilisation, costs, and patient outcomes. *Cochrane Database of Systematic Reviews* 2000;(3):CD000336.
43. Koshman SL, Charrois TL, Simpson SH, McAlister FA, Tsuyuki RT. Pharmacist care of patients with heart failure: a systematic review of randomized trials. *Archives of Internal Medicine* 2008;168(7):687-94.
44. Bower P, Sibbald B. On-site mental health workers in primary care: effects on professional practice. *Cochrane Database of Systematic Reviews* 1999;(4):CD000532.
45. Harkness EF, Bower PJ. On-site mental health workers delivering psychological therapy and psychosocial intervention to patients in primary care: Effects on the professional practice of primary care providers. *Cochrane Database of Systematic Reviews* 2009;(1):CD000532.
46. Swider SM. Outcome effectiveness of community health workers: an integrative literature review. *Public Health Nursing* 2002;19:11-20.
47. Norris SL, Chowdhury FM, Van Le K, Horsley T, Brownstein JN, Zhang X et al. Effectiveness of community health workers in the care of persons with diabetes. *Diabetic Medicine* 2006;23(5):544-56.
48. Brownstein JN, Chowdhury FM, Norris SL, Horsley T, Jack LJr, Zhang X et al. Effectiveness of community health workers in the care of people with hypertension. *American Journal of Preventive Medicine* 2008;32(5):435-47.

49. Lewin SA, Dick J, Pond P, Zwarenstein M, Aja G, van Wyk B et al. Lay health workers in primary and community health care. *Cochrane Database of Systematic Reviews* 2005;(1):CD004015.
50. Barrett J, Curran V, Glynn L, Godwin M. *CHSRF Synthesis: Interprofessional Collaboration and Quality Primary Healthcare*. Ottawa, Canada: Canadian Health Services Research Foundation; 2007.
51. Lemieux-Charles L, McGuire WL. What do we know about health care team effectiveness? A review of the literature. *Medical Care Research and Review* 2006;63(3):263-300.
52. Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? A literature review. *International Journal of Nursing Studies* 2008;45(1):140-53.
53. Malone D, Newron HG, Simmonds S, Marriot S, Tyrer P. Community mental health teams (CMHTs) for people with severe mental illnesses and disordered personality. *Cochrane Database of Systematic Reviews* 2007;(3): CD000270.
54. Zwarenstein M, Bryant W. Interventions to promote collaboration between nurses and doctors. *Cochrane Database of Systematic Reviews* 2000;(2):CD000072.
55. Coulter A, Parsons S, Askham J. *Where are the Patients in Decision-making About their Own Care?* Copenhagen, Denmark: WHO Regional Office for Europe and European Observatory on Health Systems and Policies; 2008.
56. Hulscher MEJL, Wensing M, van-der Weijden T, Grol R. Interventions to implement prevention in primary care. *Cochrane Database of Systematic Reviews* 2006;(1):CD000362.
57. Gensichen J, Beyer M, Muth C, Gerlach FM, Von KM, Ormel J. Case management to improve major depression in primary health care: a systematic review. *Psychological Medicine* 2006;36(1):7-14.
58. Jacobson-Vann JC, Szilagyi P. Patient reminder and recall systems for improving immunization rates. *Cochrane Database of Systematic Reviews* 2008;(3):CD003941.
59. Gruen RL, Weeramanthri TS, Knight SE, Bailie RS. Specialist outreach clinics in primary care and rural hospital settings. *Cochrane Database of Systematic Reviews* 2003;(4):CD003798.
60. Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the Chronic Care Model in the new millennium. *Health Affairs* 2009;28(1):75-85.
61. Tsai AC, Morton SC, Mangione CM, Keeler EB. A meta-analysis of interventions to improve care for chronic illnesses. *American Journal of Managed Care* 2005;11(8):478-88.
62. Gruen RL, Bailie R. Specialist clinics in remote Australian Aboriginal communities: where rock art meets rocket science. *Journal of Health Services Research and Policy* 2004;9(Supplement 2):S2:56-S2:62.
63. Beach MC, Gary TL, Price EG, Robinson K, Gozu A, Palacio A et al. Improving health care quality for racial/ethnic minorities: a systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health* 2006;6(104).
64. Chapman JL, Zechel A, Carter YH, Abbott S. Systematic review of recent innovations in service provision to improve access to primary care. *The British Journal of General Practice* 2004;54(502):374-81.
65. Maxwell J, Jackson K, Legowski B, Rosell S, Yano E. *Report on Citizen's Dialogue on the Future of Health Care in Canada*. Ottawa, Canada: Commission on the Future of Health Care in Canada; 2002.

66. Hutchison B, Abelson J, Lavis JN. Primary care in Canada: So much innovation, so little change. *Health Affairs* 2001;20(3):1-16.
67. Canadian Institute for Health Information. *Healthcare in Canada 2008*. Ottawa, Canada: Canadian Institute for Health Information; 2008)
68. Hutchison B. A long time coming: primary healthcare renewal in Canada. *Healthcare Papers* 2008;8(2):10-24.
69. Watson DE, Broemeling AM, Reid RJ, Black C. *Results-based Logic Model for Primary Health Care. Laying an Evidence-based Foundation to Guide Performance Measurement, Monitoring and Evaluation*. Vancouver, Canada: Centre for Health Services and Policy Research; 2004.
70. Savedoff WD, Levine R, Birdsall N. *When Will We Ever Learn? Improving Lives Through Impact Evaluation*. Washington, USA: Centre for Global Development; 2006.

APPENDICES

The following tables provide detailed information about the systematic reviews identified for each option. Reviews are presented by option element (Column 1) and are grouped by their focus. The focus of the reviews is described in the second column. Key findings from the reviews that relate to the option are listed in the third column while the fourth column presents a rating of the overall quality of the review and conveys information about the utility of the reviews' findings in terms of local applicability, equity, and issue applicability. 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*; in press).

All of the information provided in the appendix tables was taken into account by the evidence brief's authors in compiling Tables 1-3 in the main text of the brief.

Appendix 1: Summary of systematic reviews relevant to Option 1 – Support the expansion of chronic disease management in physician-led care through a combination of electronic health records, target payments, continuing professional development, and auditing/accreditation of their clinics

Option element	Focus of systematic reviews	Key findings	Observations
Patients have a regular primary care physician	Effects of strategies to increase the proportion of healthcare professionals practicing in rural and other underserved areas(16)	No studies of the effects of redistribution strategies were identified despite an exhaustive search (published in 2009).	AMSTAR (quality) rating for (16)= 8/8 One strategy focused on recruiting students from groups defined by place of residence or by race, ethnicity or culture.
	Additional reviews addressed the effects of models of after-hours care,(17) as well as the effects of community-based models of emergency care(18) and length of consultation,(19) which were less relevant.	Introduction of a telephone triage and advice line reduced the workload of physicians (which could allow them to take on additional patients)(published in 2003).	AMSTAR (quality) rating for (17)= 2/11 AMSTAR (quality) rating for (18)= 7/10 Canada was among the countries studied but the number of studies from Canada (and from other countries) was not stated.
Physicians are involved in physician-led teams	No systematic reviews were identified		
Physicians offer chronic disease management (CDM)	Effects of chronic disease management(20)	Chronic disease management improved processes of care and disease control but not health outcomes or healthcare utilization (except for reducing	AMSTAR (quality) rating for (20)= 4/10 Number of studies

Option element	Focus of systematic reviews	Key findings	Observations
		hospitalization rates among patients with congestive heart failure and increasing outpatient care and prescription drug use among patients with depression). No conclusive evidence about effects on direct medical costs (published in 2007).	from Canada was not stated (but 29 studies were included in total). Mental health was among the conditions studied.
	Additional reviews addressed the effects of primary healthcare-based asthma clinics,(21) diabetes disease management programs,(22) and other disease-specific programs.	Primary healthcare-based asthma clinics showed limited evidence of benefit (published 2009). Diabetes disease management programs improved glycemic control and increased screening for retinopathy and foot complications (published in 2005).	AMSTAR (quality) rating for (21)= 10/10 AMSTAR (quality) rating for (22)= 7/10 No studies from Canada were included in either review (but only one study was included in the first review and 24 studies were included in the second review).
Physicians use electronic health records to support CDM	Effects of electronic health records, including electronic health record-generated reminders(23)	Electronic health records in the outpatient primary healthcare setting improved provider and patient compliance with screening interventions and active problem treatment rates. No direct evidence that they reduced patient morbidity and mortality (published in 2000).	AMSTAR (quality) rating for (23)= 5/10 Five studies from Canada were included in the review (and 16 studies were included in total).
	Effects of electronic health records(24)	Electronic health records that make available clinical information management and decision support tools (particularly those that translate data into context-specific information) improved provider performance. Costing studies predicted substantial savings (published in 2006).	AMSTAR (quality) rating for (24)= 8/10 No studies from Canada were included in the review (but 256 studies were included in total).
Physicians receive target payments for CDM	Effects of physician-level and provider group-level financial incentives(25)	Physician-level financial incentives had partial or positive effects on measures of quality in five of six studies and provider-level financial incentives had similar effects in seven of nine studies. Financial incentives had unintended effects in four studies. No studies examined the optimal duration of financial incentives or the persistence of their effects after termination (published in 2006).	AMSTAR (quality) rating for (25)= 6/11 Number of studies from Canada was not stated (but 17 studies were included in total).
	Effects of pay-for-performance(26)	Pay-for-performance yielded no effects in all but two well-designed studies and positive effects in two well-designed studies (published in 2006).	AMSTAR (quality) rating for (26)= 5/10 Number of studies from Canada was not stated (but 7 studies were included in total).
	Additional reviews addressed the effects of performance-based payment for prescription drug prescribing,(27) as well as (in three older reviews) the effects of target payments(28;29) or associations between financial incentives and particular outcomes.(30)	No studies of the effects of performance-based payment for prescription drug prescribing were identified despite an exhaustive search (published in 2007).	AMSTAR (quality) rating for (28)= 10/11 AMSTAR (quality) rating for (29)= 7/11 AMSTAR (quality) rating for (30)= 4/11 Between 0 and 1 study

McMaster Health Forum

Option element	Focus of systematic reviews	Key findings	Observations
	An overview of reviews addressed the effects of results-based financing in low- and middle-income countries.(31)		from Canada was included in each review (but 4, 10 and 89 studies, respectively, were included in total).
Physicians receive effective continuing professional development for CDM	Effects of continuing medical education(32)	Continuing medical education achieved and maintained objectives related to physician knowledge, attitudes, and practice behaviour, as well as longer-term clinical outcomes (published in 2007).	All of the 136 studies were from either Canada or the United States.
	Effects of educational meetings(33)	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 (published in 2009).	Four studies from Canada were included in the review (and 81 studies were included in total).
	An additional (older) review addressed the effects of multi-faceted strategies (including continuing professional development) targeted at physicians, nurses, and pharmacists.(34)	Multi-faceted strategies (including continuing professional development) targeted at physicians (and nurses and pharmacists) improved diabetes management in primary healthcare in both outpatient and community settings (published in 2001).	No studies from Canada were included in the review (but 41 studies were included in total).
Physicians' practices are periodically audited/ accredited for CDM	Association between use of audit and improvements in chronic disease management(35)	Audit was associated with improved patient care, however, it was generally done by more developed practices, on subjects easier to audit, and the effects stop when emphasis shifts to other priorities (published in 2004).	AMSTAR (quality) rating for (35)= 4/10 No studies from Canada were included in the review (but 48 studies were included in total).

Appendix 2: Summary of systematic reviews relevant to Option 2 – Support the targeted expansion of inter-professional collaborative practice PHC

Option element	Focus of systematic reviews	Key findings	Observations
Inter-professional collaborative practice teams	Associations between the use of inter-professional collaborative practice teams and a range of outcomes, as well as the effects of inter-professional collaborative practice teams(50)	Inter-professional collaborative practice teams are associated with positive outcomes for patients/clients, providers, and the system in specialized areas such as mental healthcare and chronic disease prevention and management. Cost savings have been observed in some primary healthcare settings, such as decreased average provider and patient costs for blood pressure control and lower readmission rates for team-managed, home-based primary healthcare. Studies do not identify how variation among inter-professional collaborative practice models affects outcomes (published in 2007).	Distinction between effects and associations is not made clear. Number of studies from Canada was not stated.
	Associations between the use of inter-professional collaborative practice teams and a range of outcomes, as well as the effects of inter-professional collaborative practice teams(51)	The type and diversity of clinical expertise involved in team decision-making largely accounts for improvements in patient care and organizational effectiveness; Collaboration, conflict resolution, participation, and cohesion are most likely to influence staff satisfaction and perceived team effectiveness (published in 2006).	AMSTAR (quality) rating for (51)= 3/11 Distinction between effects and associations is clear in the text but not in the conclusions. Number of studies from Canada was not stated.
	Associations between factors and inter-professional teams working in primary and community care settings(52)	Team structure (which includes team premises, team size and composition, and organizational support) and team processes (team meetings, clear goals and objectives, and audit) had an impact on inter-professional team-working (published in 2007).	One study from Canada was included in the review.
	Effects of community mental health teams for people with severe mental illnesses and disordered personality (53)	Community mental health teams reduced dissatisfaction with services, hospital admission rates, and deaths by suicide but had no effect on admittance to emergency services, contact with primary healthcare, and contact with social services (published in 2007).	AMSTAR (quality) rating for (53)= 11/11 No studies from Canada were included in the review.
	An additional (older) review about the effects of strategies to improve doctor/nurse collaboration(54)	Interventions designed to improve doctor/nurse collaboration improved select processes of care but not outcomes (published in 2000).	AMSTAR (quality) rating for (54)= 9/11 No studies were conducted in primary healthcare settings. No studies from Canada were included in the review.

Appendix 3: Summary of systematic reviews relevant to Option 3 – Support the use of the Chronic Care Model in primary healthcare settings, which means the combination of self-management support, decision support, delivery system design, clinical information systems, health system, and community

Option element	Focus of systematic reviews	Key findings	Observations
Use of the Chronic Care Model	Effects of incorporating most or all of the Chronic Care Model elements(60)	Incorporating most or all of the Chronic Care Model improved quality of care and outcomes for patients with various chronic illnesses (published in 2009).	AMSTAR (quality) rating for (60) = 4/10 Number of studies from Canada was not stated.
	Effects of incorporating one or more Chronic Care Model elements(61)	Incorporating one or more elements of the Chronic Care Model improved processes of care and clinical outcomes for patients with asthma, congestive heart failure, depression, and diabetes (published in 2005).	AMSTAR (quality) rating for (61) = 6/11