



EVIDENCE >> INSIGHT >> ACTION

**Evidence Brief:
Developing a Rural Health Strategy in Saskatchewan**

17 June 2010

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
Professor and Canada Research Chair in Knowledge Transfer and Exchange, McMaster University

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

Funding

This evidence brief and the stakeholder dialogue it was prepared to inform were funded by the Canadian Institutes of Health Research (CIHR) through the Evidence on Tap – Expedited Knowledge Synthesis program. Saskatchewan Health partnered with CIHR on this initiative and has been working with the McMaster Health Forum to carry out the work. The views expressed in the evidence brief are the views of the authors and should not be taken to represent the views of Saskatchewan Health or CIHR.

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 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/or researchers in order to ensure its scientific rigour and system relevance.

Acknowledgements

The authors wish to thank Ameya Bopardikar, Amjed Kadhim-Saleh, Ben McCutcheon, George Farjou, Jason Akerman and Neil Dattani for research assistance, and Ileana Ciurea, Kerry O'Brien and Bella Malavolta for project management and support. We are grateful to Steering Committee members and merit reviewers for providing feedback on previous drafts of the brief. We are especially grateful to Pauline Rousseau, Anne Neufeld, and Lesley McBain for their insightful comments and suggestions.

Citation

Lavis JN, Boyko JA. Evidence Brief: Developing a Rural Health Strategy in Saskatchewan. Hamilton, Canada: McMaster Health Forum, 17 June 2010.

Product registration numbers

ISSN 1925-2242 (print)

ISSN 1925-2250 (online)

Table of Contents

KEY MESSAGES..... 5

REPORT..... 7

THE PROBLEM..... 10

 The burden of chronic disease is growing 10

 Effective healthcare programs and services are not always available or accessible to those living in rural areas 11

 Current health system arrangements do not fully support value-added rural healthcare..... 11

 Implementation of chronic disease management initiatives 13

 Additional equity-related observations about the problem..... 13

THREE OPTIONS FOR ADDRESSING THE PROBLEM..... 14

 Option 1 – Support self-management, ‘aging in place’, and healthcare-related travel..... 14

 Option 2 – Increase the breadth and accessibility of chronic disease management programs 17

 Option 3 – Optimize the use of healthcare professionals and of inter-professional teams 18

 Additional equity-related observations about the three options 19

IMPLEMENTATION CONSIDERATIONS..... 20

REFERENCES 22

APPENDICES 31

KEY MESSAGES

What's the problem?

The overarching problem is that Saskatchewan does not have an integrated approach to addressing the healthcare challenges faced by those living in rural areas.

- Chronic diseases are a significant and growing challenge in the province. For example, the relative change in the prevalence of diabetes from 1994 to 2005 among adults was 53%, and the relative change in the prevalence of hypertension was 54%.
- Effective (and cost-effective) programs and services, such as primary healthcare, chronic disease management, self-management supports, and cardiac rehabilitation, are not always reliably and consistently available or accessible to those living in rural areas.
- A variety of gaps in existing delivery arrangements (e.g., inequitable distribution of primary healthcare physicians, limited scopes of practices of other types of healthcare providers, and the lack of supports for travel to urban centres for care) and financial arrangements (e.g., significant use of contract labour and overtime compensation and of travel to receive care) likely contribute to effective programs and services not getting to those who need them in rural areas.

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

- Option 1 – Support self-management, 'aging in place,' and healthcare-related travel
 - A recent review of reviews found that real-time home telehealth can: lead to better communication with health care providers and better quality of chronic disease monitoring; reduce mortality for patients with congestive heart failure; and be as effective as in person-care when used to support providers and patients with neurological or psychiatric conditions in remote communities. Two recent reviews found limited evidence to support the use of culturally appropriate health education, and an older review found limited evidence to support the impact of outreach in rural and disadvantaged settings.
- Option 2 – Increase the breadth and accessibility of chronic disease management programs
 - A recent medium-quality review found that incorporating one or more elements of the Chronic Care Model improved quality of care and clinical outcomes for patients with various chronic diseases, and two older medium-quality reviews found similar findings. One older medium-quality review about the economic effects of disease management in patients with chronic diseases found a few studies that demonstrated a notable reduction in costs.
- Option 3 – Optimize the use of healthcare professionals and of inter-professional teams
 - A recent medium-quality review found that community mental health teams may be superior in reducing hospital admission and avoiding death by suicide, and two reviews demonstrated that patients were generally satisfied with inter-professional teams. An older, low-quality review that focused on recruitment strategies found that return-of-service commitments have been found to affect the short-term recruitment of healthcare providers in rural communities. One recent high-quality review found low-quality evidence suggesting that the involvement of indigenous health workers in asthma programs was beneficial for some asthma outcomes. The evidence on continuing professional development shows that multi-faceted guideline dissemination and implementation interventions that target health professionals were generally effective for improving the appropriateness of care, as were a number of "single-faceted" interventions, including distribution of educational materials, educational meetings, audit and feedback, and reminders and prompts. Several reviews pertaining to computerized decision support for health providers also show evidence of effectiveness. A recent medium-quality review found that quality improvement collaboratives showed moderate positive results on care processes and outcomes of care.

What implementation considerations need to be kept in mind?

- Little research evidence is available about implementation barriers and strategies.
- All three of the options require emphasis on addressing the unique needs of all individuals living in rural areas in general, while recognizing that specific communities and groups of individuals within rural areas have unique needs as well.

“The Canadian healthcare system faces many challenges, some of the greatest of which are providing for the healthcare needs of those who live in rural and remote areas of the country.”(1)

REPORT

In Saskatchewan, where more than one third of the population lives in rural areas, geographic location can be an important factor affecting health, healthcare, and quality of healthcare.(2) Although all people living in Saskatchewan should have equal access to publicly insured healthcare programs and services under the terms of the *Canada Health Act*, those living in rural areas (including those living in northern/remote areas) may not be receiving the healthcare they need. As one rural resident described their experience with the healthcare system: “It’s almost as if you can’t get sick after 9 p.m. here – because there is nowhere for you to go if you do.”(3)

Efforts have been made over the past 12 years by the federal government and the provincial government to improve healthcare for those living in rural parts of Saskatchewan. For example, the federal government has taken steps to address the healthcare needs of those living in rural Canada through:

- establishing the Office of Rural Health in 1998 to ensure that the views and concerns of rural Canadians are better reflected in national policy;
- providing \$50 million in funding over three years (from 1999-2000 to 2001-2002) to support pilot projects under the “Innovations in Rural and Community Health Initiative;”
- establishing a National Strategy on Rural Health in 2000 focused on ensuring that all Canadians have reliable access to quality healthcare; and
- establishing a Ministerial Advisory Committee on Rural Health in 2001 to provide advice about how the federal government can improve the health of rural communities and individuals.(1)

At the provincial level, Saskatchewan Health initiated the Patient First Review in 2008 to: 1) find out what Saskatchewan residents feel about the way healthcare services are delivered; 2) explore ways to improve the patient experience in the province; 3) examine healthcare administration; and 4) find ways to optimize the way healthcare services are managed and delivered. The Patient First Review included a comprehensive research and consultation process involving Saskatchewan citizens, healthcare providers and system leaders.

A key message from the Patient First final report is that Saskatchewan’s healthcare system is a good basic system

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 partner organization (and select 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 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.

that needs some quality improvements in many areas.(4) The report includes 16 recommendations, 13 of which focus on improving the patient experience (and three of which focus on improving system performance and leadership). Among these recommendations is that a comprehensive and innovative strategy for rural and remote healthcare service delivery is required that:

- improves access to primary healthcare, diagnostic and specialist services for rural and remote residents;
- examines the cost burden of emergency transportation, including inter-facility transfers; and
- includes a range of supports for people who must obtain health services away from their home communities.(4)

In essence, this recommendation calls for efforts to ensure that patients receive appropriate care when they need it, regardless of where they live.(4)

Since the results of Saskatchewan's Patient First Review were released in October 2009 (which included a set of recommendations from Commissioner Tony Dagnone, as well as reports by two consulting companies), Saskatchewan Health has been engaged in a strategic planning process to create a framework for change. As one input to this process, Saskatchewan Health partnered with the Canadian Institutes of Health Research to commission an “expedited knowledge synthesis” to inform this process. The purpose of this evidence brief, which will be used to inform a stakeholder dialogue that brings stakeholders’ views and experience into the knowledge synthesis, is to review the research evidence about: 1) problems underlying the current organization of rural healthcare in Saskatchewan; 2) three options for addressing the problems and enhancing what is already being done; and 3) key implementation considerations for moving the options forward. The broader goal of the evidence brief is to inform the development of a rural “Patient First” health strategy for Saskatchewan that is built upon five health system pillars: 1) the health of the individual; 2) the health of the population; 3) providers; 4) sustainability; and 5) supportive processes.(5)

The scope of the evidence brief was framed in three ways. First, ‘rural’ was defined as any area outside the following eight centres: Saskatoon, Regina, Moose Jaw, North Battleford, Prince Albert, Swift Current, Yorkton and Estevan. Second, while the focus of the evidence brief is rural areas, significant differences between northern/remote areas and other rural areas are noted where appropriate. Third, while various aspects of rural living may affect health status, the focus of the evidence brief is healthcare programs and services and the

Box 2: Equity considerations (part 1)

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.

While the evidence brief strives to address all of those living in Saskatchewan’s rural areas (see Box 3), illustrative examples of equity considerations arising in the available data and research evidence are provided for two groups:

- people living with two or more chronic diseases; and
- people with mental illness and/or addictions.

Many other groups (e.g., people living in remote/northern communities, seniors, First Nations and Métis populations, and people with lower socioeconomic status) 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.

organization of the healthcare system (and not the social determinants of health more generally).

The following key features of the health policy and system context in Canada were also taken into account in preparation of this evidence brief:

- Saskatchewan’s healthcare system is distinguished by a combination of private not-for-profit and public (i.e., regional health authority) delivery of physician and hospital services, and public payment of all medically necessary physician and hospital services;
- although an agreement with physicians has historically meant that most healthcare is delivered by physicians working in private practice with first-dollar (i.e., no deductibles or cost sharing), public (typically fee-for-service) payment, many physicians currently work under contractual arrangements that involve alternative remuneration mechanisms;
- the private practice element of the agreement 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);⁽⁶⁾
- other healthcare providers such as nurses, physiotherapists and psychologists, and teams led by these providers, are typically not eligible for public fee-for-service payment on the same guaranteed terms as physicians (or at least not on terms that make independent healthcare practices viable), however, they may be paid through provincial or regional programs;
- prescription drugs and medical devices and supplies are often not eligible for public payment and, when they are eligible (e.g., through the Special Support Program and Family Health Benefits for Low-income Families), it is typically not with the same type of first-dollar coverage provided for physician-provided and hospital-based care, and hence must also be paid for out-of-pocket or by private health insurance plans; and
- First Nations people living on reserves may receive healthcare services provided directly by Health Canada or they may have more direct control over the provision of services that they operate with funding from Health Canada.

Box 3: Equity considerations (part 2)

In order to give readers concrete examples of the people that a rural health strategy would need to ‘work for,’ below are three patient profiles developed to inform the Patient First Review.

“Darryl is 8 years old with moderate persistent asthma and lives with his mother, three siblings (also with asthma) and maternal grandparents in a three-bedroom house in rural Saskatchewan. His mother works and can’t bring Darryl for his appointments. He stays with his father on weekends who doesn’t believe Darryl has asthma. Darryl has been admitted multiple times since two months of age for Respiratory Acute Distress/Asthma (including ICU). He was recently discharged for an asthma exacerbation.”

“Mary is 40 years old and works as a teacher’s aid with two schoolage children. A laparoscopy for suspected gall-bladder disease showed that instead she had non-Hodgkin’s Lymphoma. Mary has a history of depression and was first diagnosed with postpartum depression after the birth of her first child. Mary lives in a small town, 280 km from the nearest cancer centre.”

“William is 78 years old and has lived near Black Lake his entire life. In the past William has relied on traditional healing methods and has had limited contact with a physician. Last night he was transported to Prince Albert as four of the five toes on his right foot are black. His first language is Dené and he has travelled outside his community only once before when he was a teenager. The doctors know they must act fast but cannot effectively communicate with William.”

Mary is an example of someone living with two chronic diseases (depression and now cancer, once she is through the acute phase of treatment), one of which is a mental illness. She constitutes a particularly good illustrative example that can be used to identify equity considerations arising in the available data and research evidence

Source of the patient profiles reproduced above:
<http://www.patientfirstreview.ca/patient-profiles>

THE PROBLEM

Problems underlying the healthcare challenges faced by those living in rural areas can be understood by considering: 1) the growing burden of chronic diseases in rural areas; 2) the effective (and cost-effective) programs and services that must be provided within the healthcare system to meet the needs of those living in rural areas; 3) the current health system arrangements that contribute to cost-effective programs and services being available to those who need them in rural areas; and 4) the degree of implementation of agreed upon courses of actions, including the 2004 provincial diabetes plan. The overarching problem is that Saskatchewan does not have an integrated approach to addressing these problems.

The burden of chronic disease is growing

Chronic diseases constitute the leading causes of death in all Canadian provinces, including Saskatchewan. According to Statistics Canada, in the country as a whole:

- 23% of adults in 2008 had diabetes, heart disease, stroke and/or high blood pressure;(7)
- 2% of those aged 20-29 years in 2005 had two or more chronic diseases, meaning (in this case) at least one of arthritis, cancer, chronic obstructive pulmonary disease (COPD), diabetes, heart disease, high blood pressure and mood disorders, and 11% had one chronic disease;(8;9)
- among those aged 80 years or more in 2005, 48% had two or more chronic diseases and 34% had one chronic disease;(8;9) and
- cancer, heart disease, and stroke were the three leading causes of death and were together responsible for 58% of all deaths in 2005.(10)

The World Health Organization estimates that 89% of all deaths in Canada in 2005 were caused by chronic diseases.(11)

In Saskatchewan in particular, the prevalence of chronic diseases, including diabetes and cardiovascular disease, is increasing. For example, based on data from the National Population Health Survey and Canadian Community Health Survey, the relative change in (age- and sex-adjusted) prevalence of diabetes from 1994 to 2005 among adults in Saskatchewan (aged 20 years and older) was 53%.(12) The same study showed that the relative change in (age- and sex-adjusted) prevalence of hypertension from 1994 to 2005 among adults in Saskatchewan (aged 20 years and older) was 54%.(12) While the overall prevalence of diabetes in Saskatchewan rose from 5.4% in 2001-2002 to 6.8% in 2005-2006, diabetes prevalence is much higher in northern areas of the province.(13)

Among the Registered Indian population in Saskatchewan, the prevalence of diabetes is 3.5 times higher than the rest of population.(13) In terms of alcohol consumption (a risk factor for many chronic diseases), the 2004 Northern Health Indicators Report found that in off-reserve communities, 46% of northern Saskatchewan males aged 12 and over, who currently drink, reported heavy drinking compared to the provincial average of 33%. Also, 25% of northern females aged 12 and over, who currently drink, reported

Box 4: 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 “hedgies” in MedLine, namely those for appropriateness, processes and outcomes of care (which increase the chances of 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 (Saskatchewan) Health Quality Council, Canadian Institute for Health Information, Health Council of Canada, European Observatory on Health Systems and Policies, Health Evidence Network, Health Policy Monitor and Organization 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 Saskatchewan or in Canada more generally) and that took equity considerations into account.

heavy drinking, compared to 16% in the province as a whole.(14) The high rate of female drinking is a serious concern due to the risk of fetal alcohol spectrum disorders among women who are pregnant.

It is also worth noting that while the incidence and prevalence of communicable disease are not as concerning as they are for chronic diseases, tuberculosis is an exception. Although the risk of developing tuberculosis is low among Canadians overall, Saskatchewan had the highest rates of new and recurring cases of tuberculosis among northern Canadian regions between 1999 and 2003 (although in 2003, Nunavik's rates were slightly higher). Among northern First Nations and Métis populations located off reserve, these rates translated into 22 new cases of tuberculosis in 2002 and 24 new cases in 2003.(13)

Effective healthcare programs and services are not always available or accessible to those living in rural areas

In Saskatchewan, effective (and cost-effective) healthcare programs and services are not always available or accessible to individuals living in rural areas. Several examples illustrate this problem. A lack of reliable and consistent access to high-quality primary healthcare services has likely contributed to high hospitalization rates for preventable conditions. For example, from 1999 to 2004 among people 20 years of age and older, the average hospital admissions rate for diabetes-related emergencies (e.g., dangerously high or low blood sugar) that could have been prevented with comprehensive disease management and delivery of care was 5.5 per 1,000 people with diabetes mellitus.(15) Moreover, while data could not be identified about the proportion of rural residents that have access to team-based primary healthcare services, we do know that such services are only available to 31% of those living in the province.(4) Existing chronic disease management (and prevention) programs, like the LiveWell program, are only offered in six health regions across the province. Although data about the existence and coverage of self-management support programs in rural areas could not be found, the lack of access to chronic disease management programs suggests that self-management (an integral aspect of any chronic disease management program) is largely unsupported in rural areas as well. The lack of cardiac rehabilitation programs outside larger urban areas limits access by those living in rural areas to this important value-added component of post-heart attack care.(13)

Specific populations within rural communities are particularly affected by the availability and accessibility of healthcare programs and services. Rural seniors, for example, are more likely to receive high-risk 'potentially avoidable' medications than Saskatchewan seniors in general,(13) which may reflect a lack of value-added programs to address medication error in rural areas. First Nations and Métis individuals, who often have to travel to receive the healthcare they need, may be placed in culturally inappropriate accommodation or receive other forms of culturally inappropriate supports. For example, findings from the Patient First Review reflect negative patient experiences with the healthcare system, including cultural insensitivity towards patients by healthcare workers.(16) While the prevalence of asthma is lower in rural areas than in urban areas, hospital admission rates for asthma among the Registered Indian population are higher than among the general population, which suggests that asthma programs (which are typically based in urban centres) may not be available or accessible to First Nations and Métis people. Furthermore, it is not clear whether any of the 29 registered asthma educators in Saskatchewan are accessible to First Nations and Métis people living in rural areas.(13)

Current health system arrangements do not fully support value-added rural healthcare

A variety of gaps in existing delivery arrangements and financial arrangements likely contribute to effective (and cost-effective) healthcare programs and services not always being available or accessible to those who need them in rural areas.

In terms of **delivery arrangements**, there are at least four key problems, as well as indicators suggestive of other problems. The first key problem is that rural areas in Saskatchewan, and in Canada more generally, are affected by an inequitable distribution of primary healthcare physicians.(17) In order to alleviate this problem, international medical graduates (IMGs) are often hired. IMGs receive a provisional licence to practice medicine in Canada by filling positions that Canadian medical graduates generally do not take.(17;18) However, IMGs rarely stay in these rural communities over long periods of time. A study published in 2009 by the Saskatchewan College of Physicians and Surgeons tracked a cohort of 39 IMGs in rural Saskatchewan and found that more than half (51%) left the province within five years.(19)

A second problem related to delivery arrangements is that health professionals' scope of practice has not been optimized to provide comprehensive care to rural populations. For example, according to the Saskatchewan Nurse Practitioner Association, although there has been an increase of 55% in the number of nurse practitioner positions in Saskatchewan since 2003, nurse practitioners are not practising in or near their home communities and are not practising to their full scope of practice.(20) Pharmacists are another professional group whose scope of practice has not been optimized. However, while Saskatchewan pharmacists currently have very limited power in terms of prescribing, proposed changes to *The Pharmacy Act* could allow pharmacists to dispense drug refills and provide a limited supply of a prescribed medicine in an emergency.(21)

Third, individuals living in rural areas have limited access to specialist services and often have to travel (or migrate to urban centres) to receive specialty care. In 2000, Saskatchewan had 62 specialists per 100,000 while the national average was 93.(22) According to Saskatchewan Health's Action Plan for Health, provincial hospitals in Regina and Saskatoon perform 72 per cent of all surgeries in the province, and many of the hospitals' patients come from outside these centres.(23) Travelling to these facilities may not be seen as an option for many people living in rural areas, either because of cultural considerations or because of travel and accommodation costs. The lack of supports for those receiving care in urban centres has been examined in terms of impact on utilization of specific services such as surgical procedures(24) and long-term care,(25) but not examined systematically in terms of the relative importance of different patient-centred supports.

A fourth problem related to delivery arrangements is gaps in the current continuum of care provided through community care (including homecare) and long-term care for seniors. According to the Minister of Health, Don McMorris, Saskatchewan Health has undertaken preliminary work that identifies such gaps and the likelihood that these gaps will increase in size as the size of the seniors population increases.(26) Related gaps for seniors that have been noted anecdotally include: 1) access to facilities and services to allow rural seniors to age in their communities; and 2) access to culturally appropriate long-term care for First Nations and Métis populations.(4) The lack of formalized infrastructure to help patients live well with their chronic conditions and to help healthcare providers coordinate care more effectively, which includes the lack of electronic health records, may be one obstacle to addressing gaps in the continuum of care(4) and to achieving patient- and family-centred healthcare in the province.

One indicator suggestive of other problems in rural areas pertains to unmet healthcare needs. While 12.5 per cent of the Saskatchewan population reported unmet healthcare needs in 2000-2001, which was the same as the national average at that time,(27) two of the three regions with the highest percentage of the population reporting unmet needs were rural (17.1% in the Northern Health Services Branch and 14.9% in Weyburn), whereas two of the three regions with the lowest percentage of the population reporting unmet needs were urban (11.4% in North Battleford and 11.1% in Moose Jaw).(27) Overall, between 1994-95 and 2000-01, there was a three-fold increase in unmet healthcare needs, both for Saskatchewan and for Canada overall.(27;28)

A second indicator pertains to satisfaction with healthcare services. Based on research that included discussion groups, interviews and a telephone survey of people living in Saskatchewan, the Patient First Review reported that First Nations, Métis and residents of rural regions had lower levels of satisfaction with the healthcare they received than other groups of Saskatchewan residents.(16)

Concerning **financial arrangements**, there are at least two key problems. First, the significant use of contract labour in acute and primary healthcare nursing, emergency medical services and laboratory services in rural Saskatchewan can (when supported through fee-for-service remuneration) create incentives for avoiding patients with complex problems and (when enabled through the extensive use of overtime compensation) put a strain on public financial resources. (Physicians practising or supporting nursing stations in northern Saskatchewan, on the other hand, are typically on contract and not paid on a fee-for-service basis.) Second, the high cost of travel and accommodation for those travelling to receive care can also put a strain on both public and private financial resources.

Implementation of chronic disease management initiatives

The Saskatchewan Chronic Disease Management (CDM) Collaborative is a major quality-improvement initiative to improve the care and health of people living with chronic diseases in Saskatchewan, and to improve access to physician practices.⁽²⁹⁾ While the extent of implementation of this collaborative has been evaluated,⁽²⁹⁾ it is not clear to what extent chronic disease management programs based on broader models of care (e.g., Chronic Care Model) have been implemented in rural areas. Furthermore, while the collaborative focused on diabetes was initiated in 2006,⁽²⁹⁾ it is not clear what the full extent of this initiative's impact has been on the health of rural Saskatchewan citizens. The extent of implementation of the 2004 Provincial Diabetes Plan has also not been publicly documented.

Additional equity-related observations about the problem

Largely absent from this description of the problem is information specific to the groups serving as illustrative examples of equity considerations arising in the available data and research evidence (i.e., people living with two or more chronic diseases or with mental illness and/or addiction). We do know, based on national data from 2008, that 23% of Canadians have two or more of diabetes, heart disease, stroke, and high blood pressure.⁽⁷⁾ We also know that it is challenging to determine the prevalence, and changes in prevalence, of people living with a mental health or addiction disorder given variations in study populations and utilization of different screening tools.⁽³⁰⁾ The Ontario-based Centre for Addiction and Mental Health estimates that prevalence rates for concurrent mental health and addictions range from 20 to 80 per cent among those with either a mental health or addiction concern.⁽³¹⁾ However, the available data and research evidence about health system arrangements and implementation challenges contributing to the problem do not permit us to identify equity considerations as they affect these two groups.

THREE OPTIONS FOR ADDRESSING THE PROBLEM

Many options could be selected as a starting point for deliberations designed to inform the development of a patient and family-centred rural health strategy in Saskatchewan. To promote discussion about the pros and cons of potentially viable options, three have been selected for more in-depth review. They include: 1) supporting self-management, ‘aging in place,’ and healthcare-related travel for those living in rural areas; 2) increasing the breadth and accessibility of chronic disease management programs available in rural areas; and 3) optimizing the use of health professionals working in their respective fields and of inter-professional teams in rural areas.

A fourth option, while far too large to be addressed in this evidence brief, could be to re-balance health system investments towards the non-medical determinants of health. Such an option could include elements related to income and social status, social support networks, education and literacy, employment/working conditions, social environments and physical environments, among others.

The focus in this section is on what is known about the three healthcare-related 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 self-management, ‘aging in place’, and healthcare-related travel

This option is focused on improving the experience of patients and their families within the healthcare system. In order to understand the ways in which this option could be achieved, it is useful to consider it according to three main elements and several sub-elements, including:

- providing supports for self-management and/or ‘aging in place,’ such as:
 - general supports,
 - telehealth and e-health more generally, and
 - specialist outreach services;
- providing supports to rural residents who have to travel to receive care, such as:
 - financial assistance,
 - accommodations, and
 - linguistically and culturally appropriate supports

Box 5: Mobilizing research evidence about options for addressing the problem

The available research evidence about options for addressing the problem was sought primarily from Health Systems Evidence, a continuously updated repository of syntheses of research evidence about governance, financial and delivery arrangements within health systems, and about implementation strategies that can support change in health systems. The reviews were identified by first searching the database for reviews containing “rural”, “non-urban”, “remote” or “northern” in the title and/or abstract. Additional reviews were identified by searching the database for reviews addressing features of the options that were not identified using the keywords. In order to identify evidence about costs and/or cost-effectiveness, the NHS Economic Evaluation Database (available through the Cochrane Library) was also searched using a similar approach.

The authors’ conclusions were extracted from the 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. (Please 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 review, substantial uncertainty, or concerns about quality and local applicability or 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.

- (especially for First Nations and Métis peoples); and
- engaging patients and their families in decision-making about how best to support self-management, aging in place and healthcare-related travel.

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

Table 1: Summary of key findings from systematic reviews relevant to Option 1 – Support self-management, ‘aging in place’, and healthcare-related travel

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Supports for self-management - General: A recent high-quality review found limited evidence to support the use of culturally appropriate health education for type 2 diabetes among ethnic minority groups(32) and a recent medium-quality review found limited evidence to support culturally appropriate asthma programs for children and adults from minority groups.(33) • Supports for self-management and aging in place - Telehealth and e-health more generally: A recent overview of reviews found that real-time home telehealth can: lead to better communication with health care providers and to better quality of chronic disease monitoring; reduce mortality for patients with congestive heart failure; and be as effective as in person-care when used to support providers and patients with neurological or psychiatric conditions in remote, under-served communities. A recent high-quality review found limited evidence that home telehealth for chronic disease management is effective and may contribute to reducing the consumption of health resources,(34) and another recent high-quality review found that telephone reminders for immunizations were effective for children and adults. A recent medium quality review found that rates of some processes of care (e.g., vaccinations) remain low despite the use of health information technology more generally.(35) Several older reviews also found that telemedicine is generally effective, but that the evidence is limited.(36-40) • Supports for aging in place - Specialist outreach services: An older high-quality review found that while specialist outreach can improve access, outcomes and service use, especially when delivered as part of a multifaceted intervention in urban settings, the evidence is limited on the impact of outreach in rural and disadvantaged settings.(41) • Supports for rural residents who have to travel to receive care - Financial assistance: Conditional cash transfers may be an effective approach to improving access to preventive services. However, no relevant findings were generated with regards to populations in more deprived settings.(42)
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"> • Supports for self-management - General : Cost-effectiveness studies from the United Kingdom showed that: self-care support in patients with self-defined long-term conditions was associated with a better quality-adjusted life years profile as well as a small reduction in costs;(43) a whole-system approach to self-management in inflammatory bowel disease (compared to ‘control’) led to a reduction in healthcare costs without adversely affecting patient outcomes;(44) patient self-management of anticoagulation was not cost-effective in comparison with usual care;(45) the introduction of a self-help guidebook significantly reduced consultations and hospital visits and total National Health Service costs for patients with irritable bowel syndrome, compared with conventional care;(46)and guided self-care was more cost-effective than family therapy for adolescents with bulimia nervosa.(47) • Supports for self-management and aging in place - Telehealth and e-health more generally: Cost-effectiveness studies from the United Kingdom showed that: telephone and/or face-to-face asthma reviews were a more cost-effective option as compared to usual care with no review;(48) telecardiology, compared with conventional face-to-face delivery, improved patient access at similar healthcare costs compared with the conventional approach;(49) a telephone-based pharmacy advisory service (compared with usual service available in the community) was more effective and less costly compared with usual services available in the community;(50) and targeted routine asthma using telephone triage led to more asthma patients being reviewed, at lower cost per patient and without loss of asthma control (compared with usual care).(51) One cost-effectiveness study conducted in the U.S. found that mail- and phone-based weight-loss interventions led to a greater reduction in weight than usual care, but the phone-based program appears to have been the least cost-effective and the mail-based program achieved similar cost-effectiveness to usual care.(52) • Supports for aging in place - Specialist outreach services: The above noted cost-

Developing a Rural Health Strategy

	effectiveness studies related to telehealth and e-health are also relevant because of the use of specialists reaching out to patients in the community (i.e., asthma, cardiology, pharmacy, healthy lifestyle specialists).
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"> ○ Supports for residents that have to travel to receive care: General ○ Supports for residents that have to travel to receive care: Accommodations ○ Supports for residents that have to travel to receive care: Linguistically and culturally appropriate supports • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Supports for self-management and aging in place - Telehealth and e-health more generally: One older review on the effectiveness of patient-held records on patient outcomes found no relevant studies.(53) • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ Engaging patients and their families in decision-making: No relevant evidence was found in two reviews that pertained to engaging patients and their families in decision-making about how best to support self-management and ‘aging in place.’(54;55)
Key elements of the policy option if it was tried elsewhere	<ul style="list-style-type: none"> • Not applicable
Stakeholders’ views and experience	<ul style="list-style-type: none"> • Supports for self-management and aging in place - Telehealth and e-health more generally: An older low quality review found that while public satisfaction with telephone consultations is generally high, professional satisfaction is tempered by medical and medicolegal concerns.(40)

† We consider a review “recent” if the year of last search is within the past five years and “older” if the year of last search is more than five years ago. We consider the quality rating of each review as: 0 to 3 (low-quality); 4 to 7 (medium quality); and 8 to 11 (high quality).

Option 2 – Increase the breadth and accessibility of chronic disease management programs

This option, which is focused on addressing the growing burden of chronic diseases, might involve approaches to chronic disease management that are tailored to the available resources (e.g., nursing stations) and to the needs of communities (e.g., improved coordination of care). The Chronic Care Model, for example, could be applied in general across a range of conditions, or in relation to each of its six elements (self management supports, decision support, delivery system design, clinical information systems, health system changes and community resources). Variants of the Chronic Care Model (e.g., Stanford model) that focus on particular elements (e.g., self-management) could also be utilized.

A summary of the key findings from the synthesized research evidence 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.

Table 2: Summary of key findings from systematic reviews relevant to Option 2 – Increase the breadth and accessibility of chronic disease management programs

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Chronic Care Model: One recent medium-quality review found that incorporating one or more elements of the Chronic Care Model improved quality of care and clinical outcomes for patients with various chronic diseases,(56) while two older medium-quality reviews found similar findings.(57;58) • Variants of the Chronic Care Model: Two older medium-quality reviews found that disease management programs for diabetes improve health outcomes, including glycemic control, retinopathy and foot lesions.(59;60)
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"> • Chronic Care Model: One older medium quality review about the economic effects of disease management in patients with chronic diseases found that few studies demonstrated a notable reduction in costs.(58)
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"> ○ Not applicable • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ No ‘empty’ reviews found • 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 experience	<ul style="list-style-type: none"> • Chronic Care Model: One older medium quality review found that disease management appeared to improve patient satisfaction.(58)

Option 3 – Optimize the use of healthcare professionals and of inter-professional teams

This option is focused on ensuring a rural healthcare provider workforce that is skilled, professional, diverse and committed to putting patients first. This option can be understood according to several elements, all of which focus on supporting healthcare providers in providing optimal care:

- substitution with safe and effective healthcare providers (e.g., addiction counsellors);
- role extension for existing healthcare providers (e.g., expanded scope nurses);
- use of inter-professional healthcare teams, whether ‘virtual,’ mobile or stationary (e.g., mobile addictions clinics);
- recruitment and retention of healthcare providers;
- expanding participation of First Nations and Métis populations in all health professions; and
- supports for healthcare providers, including:
 - continuing professional development,
 - decision support, and
 - engagement in quality-improvement initiatives like collaboratives.

A summary of the key findings from the 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.

Table 3: Summary of key findings from systematic reviews relevant to Option 3 – Optimize the use of health professionals working in their respective fields and of inter-professional teams

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> • Substitution with safe and effective healthcare providers: Physician assistants can provide safe, high-quality primary care services under the direction of a doctor, and respond to workforce shortages in rural and remote areas.(61) However, this finding is from a comprehensive literature review and not a systematic review of effectiveness. Furthermore, this review does not explore the implications of integrating physician assistants alongside other providers, such as nurses. • Role extension for existing healthcare providers: Registered nurses are able to provide safe, comprehensive, low-risk care in a rural maternity program. However, the review supporting this statement is of low quality.(62) • Use of inter-professional healthcare teams: One recent high-quality review found that inter-professional collaboration (IPC) can improve healthcare processes and outcomes, but that it is difficult to draw generalisable inferences about the key elements of IPC and its effectiveness due to a weak evidence base.(63) Another recent high-quality review found little evidence to support the use of shared care across the interface between primary and specialty care in chronic disease management.(64) However, another recent medium-quality review found evidence that supports positive outcomes for patients, providers and health systems in mental and chronic disease management as a result of IPC,(65) and another recent medium-quality review found that community mental health team management may be superior in reducing hospital admission and avoiding death by suicide.(66) • Recruitment and retention of healthcare providers: Return-of-service commitments have been found to affect short-term recruitment of healthcare providers in rural and remote communities.(67) However, this finding is from an older low-quality review. • Expanding participation of First Nations and Métis populations in all workforce health professions: One recent high-quality review found low-quality evidence that suggests involvement of indigenous health workers in asthma programs targeted for their own ethnic group was beneficial for some, but not all, asthma outcomes. • Supports for healthcare providers: <ul style="list-style-type: none"> ○ Continuing professional development: Multifaceted guideline dissemination and implementation interventions that target health professionals were generally effective for improving the appropriateness of care, as were a number of “single-faceted” interventions, including distribution of educational materials, educational meetings, audit and feedback, and reminders and prompts.

	<ul style="list-style-type: none"> ○ Decision support: One recent high-quality review found that point-of-care computer reminders achieved small improvements in clinician behaviour.(68) A recent medium-quality review found that asynchronous telehealth is an effective decision-support tool for providers in terms of diagnostic accuracy, wait times, referral management and provider satisfaction, (69) while a recent low quality review found that decision support in the form of computerized prompts was important, but significantly less likely than other technologies to bring success.(70) Three older medium-quality reviews demonstrated that clinical decision support systems can improve processes of care and practitioner performance.(71-73) ○ Engagement in quality-improvement initiatives: A recent medium-quality review found that quality improvement collaboratives showed moderate positive results on care processes and outcomes of care.(74)
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"> • Use of inter-professional healthcare teams: A cost-effectiveness study carried out in the U.S. showed that adding an internist to an inpatient psychiatric team is an effective way of improving care without increasing cost.(75) Another cost-effectiveness study carried out in Italy found that a multidisciplinary approach to managing heart failure (compared to usual care) can lead to improved clinical outcomes and reduced costs.(76) • Supports for healthcare providers: <ul style="list-style-type: none"> ○ Decision support: A recently published study of the impact of the electronic health record on cost (i.e., payments to providers) and process measures of quality of care found no measurable impact on the short-term cost per episode.(77) Another study published in 2005 found that a clinical decision support system did not alter the effectiveness of usual care for patients with hypercholesterolaemia, but it did induce considerable savings.(78)
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"> ○ Not applicable • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> ○ Recruitment and retention of healthcare providers: A recent review found no studies about interventions that address the inequitable distribution of healthcare professionals. • No clear message from studies included in a systematic review <ul style="list-style-type: none"> ○ Supports for healthcare providers: <ul style="list-style-type: none"> ○ Team focused continuing professional development: One recent high-quality review could not draw conclusions about the effectiveness of inter-professional education because the identified studies evaluated different education interventions and were not of high quality.(79) ○ Decision support: The evidence is unclear about design features of point-of-care reminders and the contexts in which these reminders lead to larger improvements.(68)
Key elements of the policy option if it was tried elsewhere	<ul style="list-style-type: none"> • Supports for healthcare providers: <ul style="list-style-type: none"> ○ Decision support: A recently published medium-quality review found that barriers to using informatics systems to improve care for chronic disease include costs, data privacy and security, and failure to consider workflow.(70)
Stakeholders' views and experience	<ul style="list-style-type: none"> • Use of inter-professional healthcare teams: One recent high-quality review found some findings to suggest that IPC enhances patient satisfaction.(63) • Supports for healthcare providers: <ul style="list-style-type: none"> ○ Decision support: A recent medium-quality review found that asynchronous telehealth improves patient and provider satisfaction.(69)

Additional equity-related observations about the three options

This research evidence suggests that little is known about the three options in relation to people living with two or more chronic diseases or with a mental health and addiction disorder. We found only eight reviews (41;61;62;67;80-83) that focused explicitly on rural healthcare-related issues. Among these, one included a focus on people within mental illness,(80) and none focused on people with two or more chronic diseases or on people with a concurrent mental health and addiction disorder.

IMPLEMENTATION CONSIDERATIONS

Table 4: Potential barriers to implementing the options

Levels	Option 1 – Support self-management, ‘aging in place,’ and healthcare-related travel	Option 2 – Increase the breadth and accessibility of chronic disease management programs	Option 3 – Optimize the use of health professionals and of inter-professional teams
Patient/individual	The demands of managing multiple chronic disease regimens hindered patients’ ability to properly self-manage their diabetes specifically.(84)	Chronic disease management programs may be inaccessible to some patients due to jurisdictional issues.	<p>Patients’ preference for immediate healthcare has a major impact on achieving an efficient allocation of resources for chronic disease management.(85)</p> <p>Some patients may be wary of potential disruptions in their relationship with their primary healthcare physician.(86)</p> <p>Patients may perceive substitution of healthcare providers as a ‘second best’ solution.</p>
Healthcare provider	Healthcare providers require on-going professional development and training to support self-management on an on-going basis.	<p>Healthcare providers have to ensure that a chronic disease management model can be incorporated or exist alongside a model for acute-disease management.</p> <p>Healthcare providers must ensure a chronic disease management model is culturally and linguistically appropriate for all patients.</p>	<p>Healthcare providers require community-based training.</p> <p>Guidelines are not available for team-based care.</p> <p>Face-to-face continuing professional development may be expensive and infrastructure is required to utilize technology.</p>
Organization	Organizational scale for some face-to-face self-management supports may not be viable in many rural communities.	Organizational scale for some aspects of chronic disease management models may not be viable in many rural communities.	Team-based care may not be viable in many rural communities.
System	Provincial government may be unwilling/unable to broaden the breadth and depth of public payment for healthcare, particularly during a recession.	Barriers to using informatics systems to improve care for chronic disease include costs, data privacy and security, and failure to consider workflow.(87)	Provincial government may be unwilling/unable to broaden the breadth and depth of public payment for inter-professional primary healthcare, particularly during a recession.

In order to ensure that a rural healthcare strategy for Saskatchewan works with patients to achieve the best possible care, experience and health, there are many existing programs and services that can be used as ‘models’ for overcoming some of the barriers identified. For example, any of the options could be developed using the streamlined and coordinated approach to care developed by the Rural and Remote Memory Clinic, which aims to reduce repeated travel over long distances and shorten the time to diagnosis. Alternatively, the organizing framework for patient- and family-centred healthcare developed by the Institute for Family Centred Care could be applied as well. For option 2, there are many existing chronic disease management programs, such as ‘LifeStat’ in the Kelsey Trail Health Region, which may be useful models to expand into other rural communities. LifeStat offers a remote patient monitoring system that allows a client’s chronic condition (e.g., diabetes and hypertension) to be monitored by a health professional via a computer. Also, in order to overcome challenges related to the recruitment and retention of healthcare professionals, the

McMaster Health Forum

Nursing Education Program of Saskatchewan, which is a collaborative program that offers clinical practice placements in rural and northern healthcare settings, could be used as a model for other disciplines to expand community-based training programs in rural areas.

REFERENCES

- (1) Kirby MJL, LeBreton M. *The Health of Canadians - The Federal Role. Volume Two: Current Trends and Future Challenges*. Parliament of Canada, Standing Senate Committee on Social Affairs, Science and Technology; 2002.
- (2) Statistics Canada. Population urban and rural, by province and territory (Saskatchewan). 2010. Available from: <http://www40.statcan.ca/101/cst01/demo62i-eng.htm>
- (3) Saskatchewan Ministry of Health. *Patient First Review - Patient Experience Component - Quote Bank*. 2009. Available from: <http://www.health.gov.sk.ca/patient-first-review-documents>
- (4) Dagnone T. *For Patients Sake: Patient First Review Commissioner's Report to the Saskatchewan Minister of Health*. 2009. Available from: <http://www.health.gov.sk.ca/patient-first-commissioners-report>
- (5) Saskatchewan Health. *Strategic Directions for the Health Sector*. Regina, Canada: Saskatchewan Health; 2010.
- (6) Lavis JN. *Political Elites and their Influence on Health-Care Reform in Canada*. Discussion Paper No. 26 ed. Saskatchewan: Commission on the Future of Health Care in Canada; 2002.
- (7) Canadian Institutes for Health Information. *Experiences with Primary Health Care in Canada. Analysis in Brief*. Ottawa, Canada: Canadian Institutes for Health Information; 2009.
- (8) Statistics Canada. *Canadian Community Health Survey Cycle 3.1*. 2005. Ottawa, Canada: Statistics Canada.
- (9) Health Council of Canada. *Chronic Health Conditions in Canada: A Data Supplement to "Why Health Care Renewal Matters: Learning from Canadians with Chronic Health Conditions"*. Toronto, Canada: Health Council of Canada; 2007.
- (10) Statistics Canada. *Leading causes of death in Canada, 2005*. 2005. Ottawa, Canada: Statistics Canada.
- (11) World Health Organization. *Facing the Facts: The Impact of Chronic Disease in Canada*. 2005. Available from: www.who.int/chp/chronic_disease_report/media/CANADA.pdf
- (12) Lee et al. Trends in risk factors for cardiovascular disease in Canada: temporal, socio-demographic and geographic factors. *Journal of the Canadian Medical Association* 2009;181.
- (13) Saskatchewan Health Quality Council. *Quality of Healthcare in Saskatchewan*. 2006.
- (14) Irvine J, Stockdale D, Oliver R. *North Saskatchewan Health Indicators Report, 2004*. LaRonge, Canada: The Population Health Unit; 2004.
- (15) Saskatchewan Health Quality Council. *Quality of Diabetes Management in Saskatchewan*. Regina, Canada: Saskatchewan Health Quality Council; 2006.
- (16) KPMG and Innovative Research Group Incorporated. *The Need for More Patient-and Family-centred Care*. 2009. Available from: http://www.longwoods.com/articles/images/PF-Detailed_Patient_Experience_Report.pdf
- (17) Audas R, Ross A, Vardy D. The use of provisionally licensed international medical graduates in Canada. *Journal of the Canadian Medical Association* 2005;173(11).

- (18) Nasmith L. Licence requirements for international medical graduates: Should national standards be adopted? *Journal of the Canadian Medical Association* 2000;162(6):795-6.
- (19) Stenerson HJ, Davis PM, Labash AM, Procyshyn MM. Orientation of International Medical Graduates to Canadian Medical Practice. *The Journal of Continuing Higher Education* 2009;57(1):29-34.
- (20) Nurse Practitioner Association of Saskatchewan [Internet] . NPs in Saskatchewan.
- (21) CBC News. Sask. pharmacists to get dose of prescribing power. Accessed: 3 March 010
- (22) Canadian Institutes for Health Information. Number of physicians per 100,000 population by physician type and province/territory, Canada, 1996 to 2000. 2001.
- (23) Saskatchewan Ministry of Health. *Saskatchewan. Healthy People. Healthy Province.* 2002.
- (24) Tepper J, Pollett W, Jin Y, Ellehoj E, Barrett B, et al. Utilization rates for surgical procedures in rural and urban Canada. *Canadian Journal of Rural Medicine* 2006;11(3):195-203.
- (25) Goodridge D, Lawson J, Rennie D, Marciniuk D. Rural/urban differences in health care utilization and place of death for persons with respiratory illness in the last year of life. *Rural and Remote Health* 2010;10(2):1349.
- (26) McMorris, D. Mandate letter from the Minister of Health to Laura Ross, MLA, outlining areas of focus for her duties as Legislative Secretary, Surgical Wait Times and Long-Term Care Initiative. 2009.
- (27) Statistics Canada. Percentage of population who reported unmet health care needs, by health region, 2000/01 .
- (28) Ministry of Supply and Services. *Federal, Provincial, and Territorial Advisory Committee on Population Health. Report on the Health of Canadians: Technical Appendix.* Chapter 26, Table 26 ed. Ottawa, Canada: 1996.
- (29) Saskatchewan Health Quality Council [Internet]. *Saskatchewan chronic disease management collaborative.*
- (30) Canadian Mental Health Association [Internet]. About mental health: Concurrent disorders.
- (31) Centre for Addiction and Mental Health. "People with Concurrent Disorders" in Virtual Resource for the Addiction Treatment System, Section 3: Special Populations. 2010.
- (32) Hawthorne K, Robles Y, Cannings JR, Edwards AGK. Culturally appropriate health education for type 2 diabetes mellitus in ethnic minority groups. *Cochrane Database Syst Rev* 2008;(3):Art. No.: CD006424. DOI: 10.1002/14651858.CD006424.pub2.
- (33) Bailey EJ, Cates CJ, Kruske SG, Morris PS, Chang AB, Brown N. Culture-specific programs for children and adults from minority groups who have asthma. *Cochrane Database Syst Rev* 2009;(1):Art. No.: CD006580. DOI: 10.1002/14651858.CD006580.pub4.
- (34) Tran K, Polisena J, Coyle D, Coyle K, Kluge E-HW, Cimon K et al. *Home Telehealth for Chronic Disease Management.* Ottawa, Canada: Canadian Agency for Drugs and Technologies in Health; 2008.
- (35) Shekelle P, Goldzweig CL. Costs and benefits of health information technology: an updated systematic review. London, UK: The Health Foundation; 2009.

- (36) Hersch WR, Wallace JA, Patterson PK, Kraemer DF, Nichol WP, Greenlick MR et al. Telemedicine for the Medicare Population: Pediatric, Obstetric and Clinician-Indirect Home Interventions. Rockville, USA: Agency for Healthcare Research and Quality. Evidence Report/Technology Assessment; 2001.
- (37) Currell R, Urquhart C, Wainwright P, Lewis R. Telemedicine versus face to face patient care: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2000;(2):Art. No.: CD002098. DOI: 10.1002/14651858.CD002098.
- (38) Mistiaen P, Poot E. Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home. *Cochrane Database Syst Rev* 2006;(4):Art. No.: CD004510. DOI: 10.1002/14651858.CD004510.pub3.
- (39) Stacey D, Noorani HZ, Fisher A, Robinson D, Joyce J, Pong RW. Telephone Triage Services: Systematic Review and a Survey of Canadian Call Centre Programs. Ottawa, Canada: Canadian Coordinating Office for Health Technology Assessment; 2003. Technology report no 43.2003.
- (40) Car J, Sheikh A. Telephone consultations. *BMJ* 2003;326(7396):966-9.
- (41) Gruen RL, Weeramanthri TS, Knight SE, Bailie RS. Specialist outreach clinics in primary care and rural hospital settings. *Cochrane Database Syst Rev* 2003;(4):Art. No.: CD003798. DOI: 10.1002/14651858.CD003798.pub2.
- (42) Lagarde M, Haines A, Palmer N. The impact of conditional cash transfers on health outcomes and use of health services in low and middle income countries. *Cochrane Database Syst Rev* 2009;(4):Art. No.: CD008137. DOI: 10.1002/14651858.CD008137.
- (43) Kennedy A, Reeves D, Bower P, Lee V, Middleton E, Richardson G et al. The effectiveness and cost effectiveness of a national lay-led self care support programme for patients with long-term conditions: A pragmatic randomised controlled trial. *Journal of Epidemiology and Community Health* 2007;61(3):254-61.
- (44) Richardson G, Sculpher M, Kennedy A, Nelson E, Reeves D, Roberts C et al. Is self-care a cost-effective use of resources: evidence from a randomized trial in inflammatory bowel disease. *Journal of Health Services Research & Policy* 2006;11(4):225-30.
- (45) Jowett S, Bryan S, Murray E, McCahon D, Raftery J, Richard Hobbs FD et al. Patient self-management of anticoagulation therapy: a trial-based cost-effectiveness analysis. *British Journal of Haematology* 2006;134(6):632-9.
- (46) Robinson A, Lee V, Kennedy A, Middleton L, Rogers A, Thompson DG et al. A randomised controlled trial of self-help interventions in patients with a primary care diagnosis of irritable bowel syndrome. *Gut* 2006;55(5):643-8.
- (47) Schmidt U, Lee S, Beecham J, Perkins S, Treasure J, Yi I et al. A randomized controlled trial of family therapy and cognitive behavior therapy guided self-care for adolescents with bulimia nervosa and related disorders. *American Journal of Psychiatry* 2007;164(4):591-8.
- (48) Pinnock H, Adlem L, Gaskin S, Harris J, Snellgrove C, Sheikh A. Accessibility, clinical effectiveness, and practice costs of providing a telephone option for routine asthma reviews: phase IV controlled implementation study. *British Journal of General Practice* 2007;57(542):714-22.

- (49) Dowie R, Mistry H, Rigby M, Young TA, Weatherburn G, Rowlinson G et al. A paediatric telecardiology service for district hospitals in south-east England: an observational study. *Archives of Disease in Childhood* 2009;94(4):273-7.
- (50) Elliott RA, Barber N, Clifford S, Horne R, Hartley E. The cost effectiveness of a telephone-based pharmacy advisory service to improve adherence to newly prescribed medicines. *Pharmacy World and Science* 2008;30(1):17-23.
- (51) Gruffydd-Jones K, Hollinghurst S, Ward S, Taylor G. Targeted routine asthma care in general practice using telephone triage. *British Journal of General Practice* 2005;55(521):918-23.
- (52) Sherwood NE, Jeffery RW, Pronk NP, Boucher JL, Anson A, Oyle R et al. Mail and phone interventions for weight loss in a managed-care setting: weight-to-be 2-year outcomes. *International Journal of Obesity* 2006;30(10):1565-73.
- (53) Henderson C, Laugharne R. Patient held clinical information for people with psychotic illnesses. *Cochrane Database of Systematic Reviews*: 1999;(3).
- (54) Wetzels R, Harmsen M, Van WC, Grol R, Wensing M. Interventions for improving older patients' involvement in primary care episodes. *Cochrane Database Syst Rev* 2007;(1):Art. No.: CD004273. DOI: 10.1002/14651858.CD004273.pub2.
- (55) Crawford MJ, Rutter D, Manley C, Weaver T, Bhui K, Fulop N et al. Systematic review of involving patients in the planning and development of health care. *BMJ* 2002;325(7375):1263.
- (56) 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.
- (57) 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.
- (58) Ofman JJ, Badamgarav E, Henning JM, Knight K, Gano Jr AD, Levan RK et al. Does disease management improve clinical and economic outcomes in patients with chronic diseases? A systematic review. *American Journal of Medicine* 2004;117(3):182-92.
- (59) 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.
- (60) Norris SL, Nichols PJ, Caspersen CJ, Glasgow RE, Engelgau MM, Jack L et al. The effectiveness of disease and case management for people with diabetes. A systematic review. *American Journal of Preventive Medicine* 2002;22(4:Suppl):15-38.
- (61) O'Connor TM, Hooker RS. Extending rural and remote medicine with a new type of health worker: Physician assistants. *Australian Journal of Rural Health* 2007;15(6):346-51.
- (62) Medves JM, Davies BL. Sustaining rural maternity care--don't forget the RNs. *Canadian Journal of Rural Medicine* 2005;10(1):29-35.
- (63) Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database Syst Rev* 2009;(3):Art. No.: CD000072. DOI: 10.1002/14651858.CD000072.pub2.

- (64) Smith SM, Allwright S, O'Dowd T. Effectiveness of shared care across the interface between primary and specialty care in chronic disease management. *Cochrane Database Syst Rev* 2007;(3):CD004910.
- (65) Barrett J, Curran V, Glynn L, Godwin M. CHSRF Synthesis: Interprofessional Collaboration and Quality Primary Healthcare. Ottawa, Canada: Canadian Health Services Research Foundation; 2007.
- (66) 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 Syst Rev* 2007;(3):Art. No.: CD000270. DOI: 10.1002/14651858.CD000270.pub2.
- (67) Sempowski IP. Effectiveness of financial incentives in exchange for rural and underserved area return-of-service commitments: Systematic review of the literature. *Canadian Journal of Rural Medicine* 2004;9(2):82-8.
- (68) Shojania KG, Jennings A, Mayhew A, Ramsay CR, Eccles MP, Grimshaw J. The effects of on-screen, point of care computer reminders on processes and outcomes of care. *Cochrane Database Syst Rev* 2009;(3):Art. No.: CD001096. DOI: 10.1002/14651858.CD001096.pub2.
- (69) Deshpande A., Khoja S, Lorca J, McKibbin A, Rizo C, Jadad AR. Asynchronous Telehealth: Systematic Review of Analytic Studies and Environmental Scan of Relevant Initiatives. [Technology report no 101]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2008.
- (70) Dorr D, Bonner L, Cohen AN, Shoai RS, Perrin R, Chaney E et al. Informatics systems to promote improved care for chronic illness: a literature review. *Journal of the American Informatics Association* 2007;14(2):156-64.
- (71) Balas EA, Krishna S, Kretschmer RA, Cheek TR, Lobach DF, Boren SA. Computerized knowledge management in diabetes care. *Med Care* 2004 June;42(6):610-21.
- (72) Jackson CL, Bolen S, Brancati FL, Batts-Turner ML, Gary TL. A systematic review of interactive computer-assisted technology in diabetes care. *Journal of General Internal Medicine* 2006 February;21(2):105-10.
- (73) Garg AX, Adhikari NK, McDonald H, Rosas-Arellano MP, Devereaux PJ, Beyene J et al. Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: a systematic review. *JAMA* 2005 March 9;293(10):1223-38.
- (74) Schouten LM, Hulscher ME, van Everdingen JJ, Huijsman R, Grol RP. Evidence for the impact of quality improvement collaboratives: A systematic review. *BMJ* 2008;336:1491.
- (75) Rubin AS, Littenberg B, Ross R, Wehry S, Jones M. Effects on processes and costs of care associated with the addition of an internist to an inpatient psychiatry team. *Psychiatric Services* 2005;56:463-7.
- (76) Piepoli MF, Villani GQ, Aschieri D, Bennati S, Groppi F, Pisati MS et al. Multidisciplinary and multisetting team management programme in heart failure patients affects hospitalisation and costing. *International Journal of Cardiology* 2006;111:377-85.
- (77) Welch WP, Bazarko D, Ritten K, Burgess Y, Harmon R, Sandy LG. Electronic Health Records in Four Community Physician Practices: Impact on Quality and Cost of Care. *J Am Med Inform Assoc* 2007 May 1;14(3):320-8.
- (78) Cobos A, Vilaseca J, Asenjo C, Pedro BJ, Sanchez E, Val A et al. Cost effectiveness of a clinical decision support system based on the recommendations of the European Society of Cardiology and

- other societies for the management of hypercholesterolemia: report of a cluster-randomized trial. *Disease Management and Health Outcomes* 2005;13:421-32.
- (79) Reeves S, Zwarenstein M, Goldman J, Barr H, Freeth D, Hammick M et al. Interprofessional education: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2008;(1):CD002213.
- (80) Meyer PS, Morrissey JP. A comparison of assertive community treatment and intensive case management for patients in rural areas. *Psychiatric Services* 2007;58(1):121-8.
- (81) 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 Syst Rev* 2009;(2):Art. No.: CD005314. DOI: 10.1002/14651858.CD005314.pub2.
- (82) Chang AB, Taylor B, Masters IB, Laifoo Y, Brown ADH. Indigenous healthcare worker involvement for Indigenous adults and children with asthma. *Cochrane Database Syst Rev* 2010;(5):Art. No.: CD006344. DOI: 10.1002/14651858.CD006344.pub3.
- (83) Glazebrook RM, Harrison SL. Obstacles and solutions to maintenance of advanced procedural skills for rural and remote medical practitioners in Australia. *Rural and Remote Health* 2006;6(4):502.
- (84) Spenceley SM, Williams BA. Self-care from the perspective of people living with diabetes. *Canadian Journal of Nursing Research* 2003;38(3):124-45.
- (85) Watts JJ, Segal L. Market failure, policy failure and other distortions in chronic disease markets. *BMC Health Services Research* 2009;9:102.
- (86) 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.
- (87) Dorr D, Bonner L, Cohen AN, Shoai RS, Perrin R, Chaney E et al. Informatics systems to promote improved care for chronic illness: a literature review. *Journal of the American Informatics Association* 2007;14(2):156-64.
- (88) Eakin EG, Bull SS, Glasgow RE, Mason M. Reaching those most in need: a review of diabetes self-management interventions in disadvantaged populations. *Diabetes/Metabolism Research Reviews* 2002;18(1):26-35.
- (89) Sarria-Santamera A, Yanez-Cadena D. *Review of Primary Care Interventions to Improve the Quality of Chronic Disease Management*. Madrid, Spain: Agencia de Evaluacion de Tecnologias Sanitarias (AETS); 2003.
- (90) Jacobson-Vann JC, Szilagyi P. Patient reminder and recall systems for improving immunization rates. *Cochrane Database Syst Rev* 2008;(4):Art. No.: CD003941. DOI: 10.1002/14651858.CD003941.pub2.
- (91) Deshpande A., Khoja S, McKibbin A, Jadad AR. Real-Time (synchronous) telehealth in primary care: Systematic review of systematic reviews. [Technology report no 100]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2008.
- (92) Gysels M, Richardson A, Higginson IJ. Does the patient-held record improve continuity and related outcomes in cancer care: A systematic review. *Health Expectations* 2006;10(1):75-91.

- (93) Winkelman WJ, Leonard KJ. Overcoming structural constraints to patient utilization of electronic medical records: A critical review and proposal for an evaluation framework. *J Am Med Inform Assoc* 2004;11:151-61.
- (94) Hersch WR, Hickam DH, Severence SM, Dana TL, Pyle Krages K, Helfand M. *Telemedicine for the Medicare Population: Update. Evidence Report/Technology Assessment No. 131* (Prepared by the Oregon Evidence-based Practice Center under Contract No. 290-02-0024.). Rockville, United States: Agency for Healthcare Research and Quality; 2006.
- (95) Rowe RE, Garcia J, Macfarlane AJ, Davidson LL. Improving communication between health professionals and women in maternity care: a structured review. *Health Expectations* 2002;5(1):63-83.
- (96) 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.
- (97) Mair F, Whitten P. Systematic review of studies of patient satisfaction with telemedicine. *BMJ* 2000;320(7248):1517-20.
- (98) Oeseburg B, Wynia K, Middel B, Reijnveld SA. Effects of case management for frail older people or those with chronic illness: A systematic review. *Nursing Research* 2009;58(3):201-10.
- (99) Day P, Rasmussen P. What is the evidence for the effectiveness of specialist geriatric services in acute, post-acute and sub-acute settings? A critical appraisal of the literature. *NZHTA Report* 2004;7(3):1-169.
- (100) 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.
- (101) Rubin AS, Littenberg B, Ross R, Wehry S, Jones M. Effects on processes and costs of care associated with the addition of an internist to an inpatient psychiatry team. *Psychiatric Services* 2005;56(4):463-7.
- (102) Sullivan SD, Lee TA, Blough DK, Finkelstein JA, Lozano P, Inui TS et al. A multisite randomized trial of the effects of physician education and organizational change in chronic asthma care: cost-effectiveness analysis of the Pediatric Asthma Care Patient Outcomes Research Team II (PAC-PORT II). *Archives of Pediatrics and Adolescent Medicine* 2005;159:428-34.
- (103) Yagura H, Miyai I, Suzuki T, Yanagihara T. Patients with severe stroke benefit most by interdisciplinary rehabilitation team approach. *Cerebrovascular Diseases* 2005;20:258-63.
- (104) Forsetlund 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 Syst Rev* 2009;(2):Art. No.: CD003030. DOI: 10.1002/14651858.CD003030.pub2.
- (105) Jamtvedt G, Young JM, Kristoffersen DT, O'Brien MA, Oxman AD. Audit and feedback: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2006;(2):CD000259.
- (106) Arnold SR, Straus SE. Interventions to improve antibiotic prescribing practices in ambulatory care. *Cochrane Database Syst Rev* 2005;(4):CD003539.
- (107) Lewin SA, Skea ZC, Entwistle V, Zwarenstein M, Dick J. Interventions for providers to promote a patient-centred approach in clinical consultations. *Cochrane Database Syst Rev* 2001;(4):CD003267.
- (108) Thomas L, Cullum N, McColl E, Rousseau N, Soutter J, Steen N. Guidelines in professions allied to medicine. *Cochrane Database Syst Rev* 2000;(2):CD000349.

- (109) Glynn L, Murphy LW, Smith SM, Schroeder K, Fahey T. Interventions used to improve control of blood pressure in patients with hypertension. *Cochrane Database Syst Rev* 2010;Art. No.: CD005182. DOI: 10.1002/14651858.CD005182.pub4.
- (110) Davey P, Brown E, Fenelon L, Finch R, Gould I, Hartman G et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev* 2005;(4):CD003543.
- (111) Gilbody S, Whitty P, Grimshaw J, Thomas R. Educational and organizational interventions to improve the management of depression in primary care: a systematic review. *JAMA* 2003;289(23):3145-51.
- (112) Shaw B, Cheater F, Baker R, Gillies C, Hearnshaw H, Flottorp S et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2005;(3):CD005470.
- (113) Faulkner A, Mills N, Bainton D, Baxter K, Kinnersley P, Peters TJ et al. A systematic review of the effect of primary care-based service innovations on quality and patterns of referral to specialist secondary care. *Br J Gen Pract* 2003 November;53(496):878-84.
- (114) Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technology Assessment* 2004;8(6).
- (115) Solomon DH, Hashimoto H, Daltroy L, Liang MH. Techniques to improve physicians' use of diagnostic tests: a new conceptual framework. *JAMA* 1998 December 16;280(23):2020-7.
- (116) O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT et al. Educational outreach visits: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2007;(4):CD000409.
- (117) Doumit G, Gattellari M, Grimshaw J, O'Brien MA. Local opinion leaders: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2007;(1):CD000125.
- (118) Bradley PM, Lindsay B. Care delivery and self-management strategies for adults with epilepsy. *Cochrane Database Syst Rev* 2008;(1):CD006244.
- (119) Harvey EL, Glenny A, Kirk SF, Summerbell CD. Improving health professionals' management and the organisation of care for overweight and obese people. *Cochrane Database Syst Rev* 2001;(2):CD000984.
- (120) Beney J, Bero LA, Bond C. Expanding the roles of outpatient pharmacists: effects on health services utilisation, costs, and patient outcomes. *Cochrane Database Syst Rev* 2000;(3):CD000336.
- (121) Pirkis JE, Jolley D., Dunt DR. Recruitment of women by GPs for pap tests: a meta-analysis. *Br J Gen Pract* 1998;48(434):1603-7.
- (122) Iraipour A, Norman I, Griffiths P. Interprofessional education to improve pain management. *Br J Community Nurs* 2006 January;11(1):29-32.
- (123) Reeves S. A systematic review of the effects of interprofessional education on staff involved in the care of adults with mental health problems. *J Psychiatr Ment Health Nurs* 2001 December;8(6):533-42.
- (124) Smits PB, Verbeek JH, de Buissonje CD. Problem based learning in continuing medical education: a review of controlled evaluation studies. *BMJ* 2002 January 19;324(7330):153-6.

- (125) Garg AX, Adhikari NKJ, McDonald H, Rosas-Arellano MP, Devereaux PJ, Beyene J et al. Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: A systematic review. *JAMA* 2005;293(10):1223-38.
- (126) Montani S BRQSdG. Meta-analysis of the effect of the use of computer-based systems on the metabolic control of patients with diabetes mellitus. *Diabetes Technology and Therapeutics* 2001;3(3):347-56.
- (127) Bott O J, Hoffmann I, Bergmann J, Gusew N, Schnell O. HIS modelling and simulation based cost-benefit analysis of a telemedical system for closed-loop diabetes therapy. *International journal of Medical Informatics* 2007;76S(S447):S455.

APPENDICES

The following tables provide detailed information about the systematic reviews identified for each option. Each row in a table corresponds to a particular systematic review and the reviews are organized by option element (first column). The focus of the 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 review. We consider a review “recent” if the year of last search is within the past five years and “older” if the year of last search is more than five years ago.

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. We consider the quality rating of each review as: 0 to 3 (low quality); 4 to 7 (medium quality); and 8 to 11 (high 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 (with reviews containing a number of studies conducted in Saskatchewan specifically or Canada more generally having a higher likelihood of being locally applicable), applicability concerning prioritized groups (people living with two or more chronic diseases and people living with mental health conditions and/or with addictions), and issue applicability (rural health). The third-from-last column notes the proportion of studies that were conducted in Saskatchewan or Canada, while the second-from-last column notes the proportion of studies included in the review that deal explicitly with one of the prioritized groups, and the last column notes the proportion of studies that deal explicitly with rural health.

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: Systematic reviews relevant to Option 1 – Support self-management, ‘aging in place,’ and healthcare-related travel

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
Supports for self-management - General	The effectiveness of culture-specific programs for children and adults from minority groups who have asthma.(33)	There is limited evidence that culture-specific programs for adults and children from minority groups with asthma are more effective than generic programs in improving some (e.g., quality of life and asthma knowledge) outcomes.	2008	7/11	0/4	0/4	Not reported
	The effects of culturally appropriate health education for type 2 diabetes mellitus among ethnic minority groups.(32)	Culturally appropriate diabetes health education appears to have short-term effects on glycemic control, knowledge of diabetes and healthy lifestyles. However, evidence is limited with regard to clinically important long-term outcomes.	2007	11/11	1/11 (Canada)	2/11 (people living with two or more chronic diseases)	1/11
	The effects of diabetes self-management interventions in disadvantaged populations.(88)	Intensive case management programs are effective only in community settings that have sufficient treatment and support services.	Published in 2002	4/10	1/10 (Canada)	0/10	2/10
	The effectiveness of primary care interventions to improve the quality of chronic disease management.(89)	Combining self-management strategies with information systems or design, offers positive outcomes in self-control. In order to improve quality and effectiveness of chronic disease management, interventions should combine organizational changes, designing of clinical practice and patient self-management. In order to achieve clinical changes, improving both clinical management and patient self-management is necessary. Effective chronic diseases care requires proactive healthcare systems and patients taking an active role in managing their disease	n/a (Full-text not available)	n/a	n/a	n/a	n/a
	The cost-effectiveness of self-care support in patients with self-defined long-term conditions.(43)	Self-care support was associated with a better quality adjusted life years profile as well as a small reduction in costs.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	The cost-effectiveness of two treatments (family therapy compared with cognitive behaviour therapy guided self-care) in adolescents with bulimia nervosa.(47)	Guided self-care among adolescents with bulimia nervosa was more cost-effective than family therapy.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The cost-effectiveness of a “whole-system” approach for the management of patients with inflammatory bowel disease in the U.K.(44)	The whole-system approach for the management of patients with inflammatory bowel disease (compared to control) led to a reduction in healthcare costs without adversely affecting patient outcomes.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The cost-effectiveness of strategies (patient self-management and usual care) administered to patients on long-term anticoagulation therapy.(45)	Patient self-management of anticoagulation was not cost-effective in comparison with usual care.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The economic impact of two self-help interventions (a comprehensive self-help guidebook and guidebook in combination with a one-off self-help group meeting).(46)	Compared with conventional care, the introduction of a self-help guidebook significantly reduced consultations and hospital visits and total National Health Service costs for patients with irritable bowel syndrome.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
Supports for self-management and aging in place – Telehealth and E-health more generally	The effectiveness of home telehealth for chronic disease management.(34)	Limited evidence shows that home telehealth is generally effective and may contribute to reducing the consumption of health resources.	2008	10/10	1/39	Not reported	Not reported
	The effectiveness of patient reminder and recall systems on improving immunization rates.(90)	In developed countries, immunization reminders such as telephone calls, letters or verbal reminders were effective for children and adults, with telephone reminders being the most effective.	2007	10/11	5/47	Not reported	2/47
	The costs and benefits of clinical health information technology (HIT) systems.(35)	Rates of some processes of care (e.g., vaccinations) remain below desired standards, despite use of HIT systems. Some evidence supports the cost-effectiveness of an electronic health record system.	2007	7/10	Not reported	Not reported	3/180

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
		Adoption of HIT is lower than desired and key barriers are cost, perceived difficulties using the system, and perceptions of adverse effects on work.					
	The effectiveness of real-time (synchronous) telehealth in primary care.(91)	Eleven high-quality reviews indicated that real-time home telehealth can lead to better communication with healthcare providers and better quality of chronic disease monitoring. Telehealth may also reduce mortality for patients with congestive heart failure, and may be as effective as in person-care when used to support providers and patients with neurological or psychiatric conditions in remote, under-served communities.	2006	n/a (Review of reviews)	4/31(reviews originating from Canada)	0/31	1/31(reviews focusing on rural health)
	The effectiveness of patient-held records on patient outcomes.(92)	Patient-held records did not appear to have an effect on clinical outcomes.	2004	9/11	1/44	Not reported	Not reported
	The conditions associated with patients' use of electronic health records.(93)	No relevant key findings. The information system research assessed did not address important social issues that arise when expanding access of electronic patient records systems to patients.	2003	2/11	Not reported	Not reported	Not reported
	The effects of telephone follow-up, initiated by a hospital-based health professional, for post discharge problems in patients discharged from hospital to home.(38)	Low quality evidence suggests that there may be some positive effects of telephone follow-up. However, effects were not constant across studies, or within patient groups.	2003	9/11	7/33	Not reported	0/33
	The effects of teletriage services on health service use, caller safety, satisfaction and health-related quality of life.(39)	Teletriage can: manage 50% of calls received without referral of the caller; and decrease the number of immediate physician visits without resulting in adverse outcomes. Two studies (one from the U.S. and one from the U.K.) show cost savings as a result of nurse teletriage services provided outside usual business hours.	2003	9/10	0/13	0/13	Not reported

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	The role of telephones in helping to deliver clinical care.(40)	<p>Telephone consultations may have the following advantages: increased speed, better access to care, and higher convenience for patients.</p> <p>While public satisfaction with telephone consultations is generally high, professional satisfaction is tempered by medical and medicolegal concerns.</p> <p>Telephone consultations may be as effective as face-to-face consultation with regards to delivery of routine healthcare to patients with chronic conditions.</p>	2002	2/11	Not reported	Not reported	Not reported
	The efficacy of telemedicine for pediatric and obstetric populations, as well as those receiving home telemedicine where the healthcare provider was involved indirectly.(94)	Limited and low-quality evidence suggests that: home-care telemedicine interventions seem beneficial in treating chronic diseases; and office/hospital-based telemedicine seem to be effective mostly for verbal interaction, such as videoconferencing used for the diagnosis and treatment in neurology and psychiatry specialties.	2004	SM: 7/11 ND: 3/10	Not reported	8/100 (mental illness)	1/100
	The effectiveness of patient-held records on patient outcomes.(95)	Patient-held maternity records increase women's involvement in and control over their care.	2000	6/11	0/11	0/11	Not reported
	The effects of telemedicine versus face to face patient care on professional practice and healthcare outcomes.(37)	Good quality evidence suggests that there is no negative effect of telemedicine in primary healthcare, emergency or home-care settings, or on patient self-monitoring of chronic diseases. However, there is little evidence about the clinical benefits of telemedicine.	1999	10/11	1/7	0/7	Not reported
	The effectiveness of patient-held records on patient outcomes.(53)	This review did not identify any relevant studies.	1999	6/11	n/a	n/a	n/a

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	The effects of electronic health records including electronic health record-generated reminders.(96)	Electronic health records in the outpatient primary healthcare setting improved provider and patient compliance with screening interventions and active problem treatment rates. However, there was no direct evidence that they reduced patient morbidity and mortality.	1999	8/10	5/16	Not reported	Not reported
	Patient satisfaction with telemedicine.(97)	Low-quality evidence suggests that teleconsultation is acceptable to patients in certain circumstances. Noted advantages included: increased accessibility of specialist expertise; less travel required; and reduced waiting times.	1998	4/11	2/32	Not reported	Not reported
	A cost-effectiveness study of the costs of a telecardiology service, compared with conventional face-to-face delivery, for pediatric cardiac consultations.(49)	A telecardiology service added to outreach services creates improved patient access at similar health care costs compared with the conventional approach.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	A cost-effectiveness study conducted in the United Kingdom on the use of a telephone-based pharmacy advisory service (compared with usual service available in the community) and adherence to newly prescribed medicines.(50)	Each adherent patient of a telephone-based pharmacy advisory service generated savings of £2,168. Therefore, the intervention was more cost-effective.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	A cost-effectiveness study conducted in the United Kingdom of different options for routine asthma reviews for patients in primary care.(48)	Telephone reviews were a more cost-effective option as compared to control (usual care with no review) for patients in primary care.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	A cost-effectiveness study of mail- and phone-based weight-loss interventions (compared to usual care).(Sherwood, 2006)	Mail- and phone-based weight-loss interventions led to a greater reduction in weight than usual care, but the phone-based program appears to have been the least cost-effective and the mail-based program achieved similar cost-	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
		effectiveness to usual care.					
	A cost-effectiveness study conducted in England on routine asthma using telephone triage compared with usual care.(51)	A cost-effectiveness study conducted in England examined targeted routine asthma using telephone triage compared with usual care and found that telephone triage of adult asthmatics led to more asthma patients being reviewed, at lower cost per patient and without loss of asthma control.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
Supports for aging in place: Specialist outreach services	The effects of case management for frail older people or those with chronic illness.(98)	No evidence was found for clinically relevant increase of service use and costs. In two of eight relevant studies, it was reported that patient advocacy case management led to decreased service use and to savings in costs.	2007	6/11	1/8	Not reported	Not reported
	The effectiveness of specialist geriatric services in acute, post-acute and sub-acute settings.(99)	Evidence generally supports the efficacy of specialist geriatric team services in community settings. Both preventive care and supportive discharge in these settings appear to provide greater benefit over usual care.	2003	8/11	4/67	Not reported	4/67
	Specialist outreach clinics in primary care and rural hospital settings.(41)	Specialist outreach can improve access, outcomes and service use, especially when delivered as part of a multifaceted intervention in urban settings. There is no strong evidence on the impact of outreach in rural and disadvantaged settings.	2002	10/11	0/9	0/9	4/9
Supports for residents that have to travel to receive care - General	No reviews found.	n/a	n/a	n/a	n/a	n/a	n/a
Supports for residents that have to travel to receive care - Financial assistance	The impact of conditional cash transfers (CCTs) on health outcomes and use of health services in low and middle income countries.(42)	CCT programs can be an effective approach to improving access to preventive services. However, no relevant findings were found in regards to populations in the more deprived settings.	2009	10/11	0/6	0/6	1/6
Supports for	No reviews found.	n/a	n/a	n/a	n/a	n/a	n/a

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
residents that have to travel to receive care - Accommodations							
Supports for residents that have to travel to receive care - Linguistically and culturally appropriate supports	No reviews found.	n/a	n/a	n/a	n/a	n/a	n/a
Engage patients and their families in decision-making about how best to support self-management, aging in place and healthcare-related travel	Interventions for improving older patients' involvement in primary care episodes.(54)	No key findings relevant to self-management.	2004	10/11	0/3	0/3	0/3
	Involving patients in the planning and development of healthcare.(55)	No key findings relevant to self-management.	2000	5/11	2/40	14/40 (mental illness)	Not reported

Appendix 2: Systematic reviews relevant to Option 2 – Increase the breadth and accessibility of chronic disease management programs

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
Chronic Care Model	Effects of incorporating most or all of the Chronic Care Model elements.(56)	Incorporating most or all of the Chronic Care Model improved quality of care and outcomes for patients with various chronic diseases.	2008	6/11	Not reported	Not reported	Not reported
	Effects of incorporating one or more Chronic Care Model elements.(57)	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.	2003	6/11	Not reported	Not reported	Not reported
	The clinical and economic effects of disease management in patients with chronic diseases.(58)	Disease management appeared to improve patient satisfaction, patient adherence and disease control. Few studies demonstrated a notable reduction in costs.	2001	6/11	Not reported	20/102 (mental illness)	Not reported
Variants of the Chronic Care Model such as the Stanford model	The effectiveness of primary care interventions to improve the quality of chronic disease management.(89) Note: The full-text version of this review has not been assessed because it is non-English.	Combining self-management strategies with information systems or design, offers positive outcomes in self-control. In order to improve quality and effectiveness of chronic disease management, interventions should combine organizational changes, designing of clinical practice and patient self-management. In order to achieve clinical changes, improving both clinical management and patient self-management is necessary. Effective chronic diseases care requires proactive healthcare systems and patients taking an active role in managing their disease.	Published in 2003	n/a	n/a	n/a	n/a
	The effect of disease management programs for patients with diabetes on processes and outcomes of care.(59)	Disease management program effects included reduced HbA1c levels, and improved screening for retinopathy and foot lesions.	2001	6/11	0/24	Not reported	Not reported
	The effectiveness and economic	Disease management programs were	2000	5/11	0/27	Not reported	Not reported

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	efficiency of disease management for adults with diabetes.(60)	found to be effective for: managing glycemic control; screening for retinopathy, foot lesions, and peripheral neuropathy and proteinuria; and on monitoring of lipid concentrations.					

Appendix 3: Systematic reviews relevant to Option 3 – Optimize the use of health professionals and of inter-professional teams to fulfill the needs of rural communities

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
Substitution with safe and effective healthcare providers	Extending rural and remote medicine with physician assistants.(61)	Physician assistants provide safe, high-quality primary care services under the direction of a doctor, and respond to work- force shortages in rural and remote areas, family practice medicine and hospital settings.	2006	n/a (Comprehensive literature review)	Not reported	Not reported	Not reported
Role extension for existing healthcare providers	The effects of using registered nurses in rural maternity care.(62)	Low-quality evidence suggests that registered nurses are able to provide safe, comprehensive and low-risk care in a rural maternity program.	Published in 2005	2/11	Not reported	Not reported	Not reported
Use of inter-professional healthcare teams (virtual, mobile and stationary)	The effects of inter-professional collaboration (IPC) on professional practice and healthcare outcomes.(63)	Practice-based IPC interventions can improve healthcare processes and outcomes, but due to the limitations in terms of the small number of studies, sample sizes, problems with conceptualizing and measuring collaboration, and heterogeneity of interventions and settings, it is difficult to draw generalisable inferences about the key elements of IPC and its effectiveness.	2007	9/11	0/5	n/a	Not reported
	Inter-professional collaboration and quality primary healthcare.(65)	High quality evidence supports positive outcomes for patients, providers and health systems in specialized areas due to inter-professional collaboration in mental and chronic disease management. Some findings suggest that IPC enhances patient self-care, knowledge, outcomes, satisfaction and practice behaviours.	Published in 2007	7/11	Not reported	Not reported	Not reported
	Community mental health teams for people with severe mental illnesses and disordered personality.(66)	Community mental health team management is not inferior to non-team standard care in any important respects, and is superior in promoting greater acceptance of treatment. Also,	2006	11/11	0/3	0/3	0/3

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
		community mental health team management may be superior in reducing hospital admission and avoiding death by suicide.					
	Effectiveness of shared care across the interface between primary and specialty care in chronic disease management.(64)	There is no evidence to support the widespread introduction of shared care services at present.	2006	9/11	0/20	6/20 (mental illness)	Not reported
	A comparison of assertive community treatment and intensive case management for patients in rural areas.(80)	Evidence suggests that intensive case management programs are effective only in community settings where there is an ample supply of treatment and support services. Limited evidence exists on this topic because many rural programs have been forced to make several adaptations to the assertive community treatment model, including smaller teams, less comprehensive staff and less intensive services, and there is no published evidence that these adaptations are able to produce the same results as full-fidelity teams.	2005	4/11	0/3	3/3 (severe mental illness)	3/3 (2 only rural, 1 mix rural-urban)
	The effectiveness of healthcare teams.(100)	The identified evidence underscores the importance of identifying the contexts in which teams are embedded. Some evidence suggests that team care can lead to better clinical outcomes and patient satisfaction, particularly in geriatric populations. There are too few studies in each setting to make generalisable comments on team-based care.	2004	3/11	Not reported	7/34 (4 on mental illness; 3 on chronic diseases)	Not reported
	The cost-effectiveness of the addition of a board-certified internist to psychiatric teams for the management of psychiatric inpatients.(101)	Adding an internist to an inpatient psychiatric team is an effective way of improving care without increasing cost.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The costs of a multidisciplinary disease	A multidisciplinary approach to	n/a (cost-	n/a	n/a	n/a	n/a

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	management program.(76)	managing heart failure (compared to usual care) can lead to improved clinical outcomes and reduced costs.	effectiveness study)				
	The cost-effectiveness of a peer leader-based physician behaviour change intervention and a practice-based redesign intervention for children aged three to 17 years who had mild to moderate persistent asthma.(102)	A peer leader-based physician behaviour change intervention and a practice-based redesign intervention for children aged three to 17 years who had mild to moderate persistent asthma both increased symptom-free days (compared to usual care), but also increased the costs associated with asthma care.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The cost-effectiveness of a stroke rehabilitation unit in comparison with a general rehabilitation ward for patients who suffered from stroke in Japan.(103)	No statistically significant differences were found in the costs of a stroke rehabilitation unit in comparison with a general rehabilitation ward for patients who suffered from stroke in Japan.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
Recruitment and retention of healthcare providers	Interventions for increasing the proportion of health professionals practising in rural and other underserved areas.(81)	No studies about interventions that address the inequitable distribution of healthcare professionals were identified that met the inclusion criteria.	2007	8/8	n/a (empty review)	n/a	n/a
	The effectiveness of financial incentives in exchange for rural and underserved area return-of-service (ROS) commitments.(67)	ROS commitments have shown effectiveness in short-term recruitment of healthcare providers in rural and remote communities. However, they were far less successful with regards to long-term retention.	2002	3/11	3/10	n/a	n/a
Expanding participation of First Nations and Métis populations in all workforce health professions	Indigenous healthcare worker involvement for Indigenous adults and children with asthma.(82)	Low-quality evidence that suggests involvement of indigenous health workers in asthma programs targeted for their own ethnic group was beneficial for some, but not all, asthma outcomes.	2008	8/11	0/1	0/1	0/1
Supports for healthcare providers -	Obstacles and solutions to maintenance of advanced procedural skills for rural and remote medical practitioners in	The barriers to the maintenance of advanced procedural skills for rural and remote medical practitioners include: lack	Published in 2002	1/11	Not reported	Not reported	Not reported

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
Continuing professional development in general	Australia.(83)	of opportunity; expense associated with remaining skilled in advanced procedural areas; lack of access to locum relief to attend educational sessions; lack of flexible options for education; lack of access to advanced procedural training; time constraints; multiple credentialing requirements from state health departments and joint consultative committees; family obstacles; and perceived medico-legal problems.					
Educational meetings	The effectiveness of multifaceted interventions that include educational meetings.(104)	Mixed effects for educational meetings on appropriateness of care.	2006	8/11	4/81	6/81 (mental illness)	Not reported
	The effectiveness of multifaceted interventions that include educational meetings.(105)	Educational meetings combined with audit and feedback were generally effective for appropriateness of care.	2004	8/11	9/118	n/a	2/118
	The effectiveness of educational meetings.(106)	Insufficient evidence to form a conclusion about the effects on appropriateness of care.	2000	7/11	6/39	n/a	2/39
	The effectiveness of multifaceted interventions that include educational meetings.(107)	Mixed effects for educational meetings on appropriateness of care.	1999	8/11	0/18	0/18	Not reported
	The effectiveness of multifaceted interventions that include educational meetings.(108)	Mixed effects for educational meetings on appropriateness of care.	1996	8/11	1/18	Not reported	Not reported
Educational materials	The effectiveness of multifaceted interventions that include disseminating educational materials.(109)	Educational interventions directed towards patients or providers seemed unlikely to effectively control blood pressure.	2010	6/11	4/77	2/77 (Hypertension and Diabetes)	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(110)	No relevant key findings.	2003	7/11	4/66	0/66	3/66
	The effectiveness of multifaceted interventions that include disseminating	No relevant key findings.	2003	6/11	Not reported	Not reported	Not reported

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	educational materials.(111)						
	The effectiveness of multifaceted interventions that include disseminating educational materials.(112)	Insufficient number of studies to draw conclusions about the overall effectiveness of educational materials.	2002	7/11	2/15	Not reported	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(113)	Educational interventions generally had an impact on clinician behaviour.	2001	7/11	Not reported	10/44 (mental illness)	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(107)	Insufficient number of studies to draw conclusions about the overall effectiveness of educational materials.	1999	8/11	0/18	0/18	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(114)	Insufficient number of studies to draw conclusions about the overall effectiveness of educational materials.	1998	7/11	12/235	Not reported	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(108)	Insufficient number of studies to draw conclusions about the overall effectiveness of educational materials.	1996	8/11	Not reported	Not reported	Not reported
	The effectiveness of multifaceted interventions that include disseminating educational materials.(115)	No relevant key findings.	1998	5/11	Not reported	Not reported	Not reported
Audit and feedback	The effectiveness of audit and feedback.(105)	Audit and feedback may be effective alone and in combination with other interventions to improve appropriate care.	2004	8/11	9/118	n/a	2/118
	The effectiveness of audit and feedback.(110)	Audit and feedback may be effective alone and in combination with other interventions to improve appropriate care.	2003	7/11	4/66	0/66	3/66
Reminders and prompts	One review focused on computerized decision support systems (CDSS).(73)	Mixed effects were observed when comparing CDSS with none for improving appropriateness of care.	1998	5/11	5/100 (Canada)	4/66 (mental health)	Not reported
Educational outreach	The effectiveness of multifaceted interventions that include educational outreach visits.(116)	Educational outreach visits compared to control was found to be generally effective for appropriateness of care.	2007	8/11	1/69	n/a	1/69
	The effectiveness of educational outreach visits.(106)	Mixed effects for educational outreach on appropriateness of care.	2000	7/11	6/39	n/a	2/39

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
Local opinion leaders	The effectiveness of local opinion leaders.(117)	Relatively few studies have assessed the effects of opinion leaders alone on professional behaviour and patient outcomes. Opinion leaders with or without another intervention were generally effective for improving appropriate care.	2005	7/11	2/12	n/a	Not reported
Patient mediated interventions	The effectiveness of patient-mediated interventions.(106)	Patient-mediated interventions may have mixed effects for appropriateness of care.	2000	7/11	6/39	n/a	2/39
	The effectiveness of patient-mediated interventions.(114)	Patient-mediated interventions may be generally effective for appropriateness of care.	1998	7/11	12/235	Not reported	Not reported
Multi-faceted interventions	The effectiveness of multifaceted interventions.(116)	No relevant key findings.	2007	8/11	1/69	n/a	1/69
	The effectiveness of multifaceted interventions that include patient-mediated interventions.(118)	Insufficient number of studies to draw any conclusions about patient-mediated interventions.	2006	9/11	0/16	n/a	1/16
	The effectiveness of multifaceted interventions.(79)	No relevant key findings.	2006	9/11	0/6	4/6 (mental illness)	Not reported
	The effectiveness of multifaceted interventions.(64)	No relevant key findings.	2006	9/11	0/20	6/20 (mental illness)	Not reported
	The effectiveness of multifaceted interventions.(118)	No relevant key findings.	2006	9/11	0/16	n/a	1/16
	The effectiveness of multifaceted interventions.(119)	No relevant key findings.	2000	9/11	0/18	Not reported	Not reported
	The effectiveness of multifaceted interventions.(106)	Mixed effects of multifaceted interventions on prescribing outcomes.	2000	7/11	6/39	n/a	2/39
	The effectiveness of multifaceted interventions.(105)	No relevant key findings.	2004	8/11	9/118	n/a	2/118
The effectiveness of multifaceted interventions.(110)	No relevant key findings.	2003	7/11	4/66	0/66	3/66	

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	The effectiveness of multifaceted interventions.(113)	No relevant key findings.	2001	7/11	Not reported	10/44 (mental illness)	Not reported
	The effectiveness of multifaceted interventions.(120)	No relevant key findings.	1999	9/11	0/25	0/25	Not reported
	The effectiveness of multifaceted interventions.(107)	No relevant key findings.	1999	8/11	0/18	0/18	Not reported
	The effectiveness of multifaceted interventions.(114)	Effect sizes did not necessarily increase with increasing number of intervention components.	1998	7/11	12/235	Not reported	Not reported
	The effectiveness of multifaceted interventions.(108)	No relevant key findings	1996	8/11	Not reported	Not reported	Not reported
	The effectiveness of multifaceted interventions that include patient-mediated interventions.(108)	Insufficient number of studies to draw any conclusions about patient-mediated interventions.	1996	8/11	Not reported	Not reported	Not reported
	The effectiveness of multifaceted interventions.(121)	No relevant key findings.	1996	8/11	1/10	n/a	0/14
Team-focused continuing professional development	The effectiveness of inter-professional education (IPE).(79)	The studies in this review evaluated different IPE interventions and were not of high quality. Therefore, it is difficult to draw conclusions about the effectiveness of IPE.	2006	9/11	0/6	4/6 (mental illness)	Not reported
	The effectiveness of inter-professional education.(122)	No relevant key findings.	2005	4/11	Not reported	Not reported	0/4
	The effectiveness of inter-professional education.(123)	IPE interventions with staff involved in the care of adults with mental health problems indicate positive outcomes. However, the studies were not of high quality.	1998	4/11	0/19	19/19 (mental illness)	Not reported
	Problem-based learning in large and small groups.(124)	No relevant key findings.	2000	4/11	Not reported	Not reported	Not reported
Supports for healthcare providers - Decision support	The effects of on-screen, point-of-care computer reminders on processes and outcomes of care.(68)	Point-of-care computer reminders achieved small improvements in behaviour of clinicians. The evidence is unclear about design features and context of these messages which associates them to larger improvements	2008	8/11	2/28	3/28 (two or more chronic diseases)	Not reported
	Asynchronous telehealth: Systematic	Several high quality studies have shown	2006	9/11	2/52	0/52	5/52

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
	review of analytic studies and environmental scan of relevant initiatives.(69)	effectiveness of asynchronous telehealth on diagnostic accuracy, wait times, referral management and patient and provider satisfaction. Studies have also shown that asynchronous telehealth can reduce unnecessary patient transfer and, in dermatology care, reduces number of unnecessary in-person visits.					
	The effects of information system design, quality, components, setting and other factors on care processes, quality outcomes and healthcare costs.(70)	<p>Components of systems correlated with positive results included: connection to a broad electronic health record system; order entry, especially when focused on the care team, specific to disease and allowing longitudinal care planning (such as specialist or case manager referrals); and population-based reporting and feedback (such as reporting back unfinished care plan elements).</p> <p>Decision support in the form of computerized prompts was found to be important, but was significantly less likely than other technologies to bring success.</p> <p>Barriers to using informatics systems to improve care for chronic disease include costs, data privacy and security, and failure to consider workflow.</p>	2005	4/11	Not reported	26/109 (mental illness)	Not reported
	How emerging interactive information technology has been used to enhance care for adults with type 2 diabetes.(72)	Information technology may assist with improving health outcomes related to diabetes by improving processes of care for type 2 diabetes patients, as indicated by the significant improvements in healthcare utilization.	2004	6/11	Not reported	Not reported	Not reported
	The effects of computerized clinical decision support systems.(125)	Many computerized clinical decision support systems improve practitioner performance. However, the effects on	2004	5/11	5/100 (Canada)	4/100 (mental illness)	Not reported

McMaster Health Forum

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
		patient outcomes remain understudied and, when studied, are inconsistent.					
	The impact of automated information interventions on diabetes care and patient outcomes.(71)	Computer-generated information for use during clinician-patient encounters improved compliance with recommended diabetes care for rates of routine diabetes care, HbA1c determinations, eye and foot examination, and other procedures. Three of four studies showed significant improvement on an overall compliance measure.	Published in 2004	7/11	0/17	Not reported	Not reported
	The effect of the use of computer-based systems on the metabolic control of patients with diabetes.(126)	The results showed a significant reduction in HbA1c from baseline to follow-up in the treatment group compared to control.	2000	3/11	Not reported	Not reported	Not reported
	The impact of the electronic health record on cost (i.e., payments to providers) and process measures of quality of care.(77)	No measurable impact on the short-term cost per episode was found.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	To determine the cost-benefit of the Intelligent Control Assistant for Diabetes (INCA), which is a project aimed at improving diabetes therapy by creating a personal closed-loop system interacting with telemedical remote control.(127)	Using INCA based on the clinical study setting would raise yearly costs by euro 2233 euros. Twenty-four percent of the INCA costs are generated by the continuous blood glucose measurement device and 5% by IT devices and services.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
	The cost-effectiveness of a clinical decision support system (CDSS) to assist physicians in the implementation of clinical practice recommendations.(78)	The CDSS did not alter the effectiveness of usual care for patients with hypercholesterolaemia but induced considerable savings.	n/a (cost-effectiveness study)	n/a	n/a	n/a	n/a
Supports for healthcare providers - Engagement in quality-	The effectiveness of quality improvement collaboratives on quality of care.(74)	Quality improvement collaboratives showed moderate positive results on care processes and outcomes of care.	2006	7/11	Not reported	0/9	Not reported

Developing a Rural Health Strategy

Option element	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in SK or Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on rural health
improvement initiatives like collaboratives							