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McMaster HEALTH FORUM

EVIDENCE BRIEF

PLANNING FOR THE FUTURE HEALTH WORKFORCE OF ONTARIO

28 SEPTEMBER 2016

EVIDENCE >> INSIGHT >> ACTION

Evidence Brief:
Planning for the Future Health Workforce of Ontario

28 September 2016

McMaster Health Forum

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

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Funding

The evidence brief and the stakeholder dialogue it was prepared to inform were funded by: 1) the Government of Ontario and 2) the Registered Nurses' Association of Ontario. The McMaster Health Forum receives both financial and in-kind support from McMaster University. The views expressed in the evidence brief are the views of the authors and should not be taken to represent the views of the Government of Ontario, the Registered Nurses' Association of Ontario or 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 researchers in order to ensure its scientific rigour and system relevance.

Acknowledgments

The authors wish to thank Aunima Bhuiya and Sonia Huang for assistance with reviewing the research evidence. We are grateful to Steering Committee members and merit reviewers for providing feedback on previous drafts of the brief. The views expressed in the evidence brief should not be taken to represent the views of these individuals.

Citation

Moat KA, Waddell K, Lavis JN. Evidence Brief: Planning for the Future Health Workforce of Ontario. Hamilton, Canada: McMaster Health Forum, 28 September, 2016.

Product registration numbers

ISSN 1925-2250 (online)

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KEY MESSAGES

What's the problem?

The recent introduction of the Patients First initiative (and the subsequent introduction of the *Patients First Act*) seeks to meet health system challenges in Ontario by focusing on four objectives: 1) improve access; 2) connect services; 3) support people and patients; and 4) protect the universal health system. Planning for the right supply, mix and distribution of health workers will be required if these objectives are to be met, although this has yet to be considered explicitly within this initiative. However, many challenges confront those engaged in health workforce planning, with the key dimensions of the problem being:

- the healthcare and health promotion/disease prevention needs of Ontarians are constantly evolving, which makes future health workforce requirements uncertain;
- current approaches to workforce planning do not reflect the realities of Ontario's changing health system;
- the way the health system is organized makes it difficult to plan for future health workforce needs; and
- political factors also make it difficult to plan for the health workforce in the long term.

What do we know (from systematic reviews) about three elements of a comprehensive approach to address the problem?

- Element 1 – Determine the short-, medium- and long-term health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs
  - Few reviews were identified that addressed this element, with the one focused on the key features of engaging stakeholders in deliberative processes finding that it is important to consider appropriate meeting environments, mix of participants, and use of research evidence
- Element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand
  - The reviews identified for this element suggest that the evidence is inconclusive about the use of staffing ratios for health workforce planning, and few studies have assessed the influence of health workforce information systems on planning initiatives
- Element 3 – Select appropriate policy levers to meet health workforce planning objectives
  - A number of reviews were identified that addressed this element, but few definitive conclusions could be drawn. The broad insights that could be gained from the identified reviews were: 1) remuneration plays an important role in influencing health workers' behaviour, but is not the only factor; 2) training professionals from rural backgrounds in rural settings is promising for recruitment and retention in rural areas; and 3) it is important to keep health workers engaged and involved in governance, decision-making, education and training.

What implementation considerations need to be kept in mind?

The emphasis on system transformation in Ontario with the introduction of Patients First presents a window of opportunity for improving health workforce planning in the province. However, pursuing element 1 in a comprehensive way to inform elements 2 and 3 may encounter a number of barriers, including:

- pursuing all elements would require significant investments in resources and time; and
- engaging all relevant stakeholders could result in gridlock that may sidetrack progress, and result in no practical actions being taken.

REPORT

In the past decade Ontario has made significant progress towards improving the health of Ontarians. For instance, life expectancy at birth rose from 80.5 years to 81.5 years between 2003/2005 and 2007/2009 (the most recent years for which data are available), and infant mortality has declined. A survey from 2013 indicates that nearly two-thirds of Ontarians self-report that they are in very good or excellent health. Rates of physical activity have increased, and the number of people who are obese (17%) and smoke (18%) are among the lowest in Canada.(1)

Progress has also been made in strengthening the health system so that the right mix of programs, services and 'technologies' (such as drugs) get to those who need them. For example, most Ontarians (94%) report having access to a primary-care provider, and most home-care patients (95%) who require home-care services receive a visit from a nurse within three days. Furthermore, the median wait time for a place in a long-term care home has decreased for patients who need to transition out of their existing homes.(1;2)

On the other hand, several challenges remain in the province. As with many other jurisdictions in Canada and in the countries that make up the Organization for Economic Development (OECD), a rapidly aging population means more Ontarians than ever are living longer, with nearly 15% of the province's population aged 65 or older in 2011 – a number that is expected to double in the next two decades.(3;4) The continued exposure to risk factors such as unhealthy behaviours, and the complex social and environmental determinants of these behaviours, mean that more Ontarians than ever are living with at least one, and sometimes multiple, chronic illnesses such as cancer, diabetes and heart disease.(5) These developments have created a greater demand for more robust preventive measures through public health, greater access to primary care and to home and community care, and more intensive (and expensive) services in acute-care settings.(4;6)

Box 1: Background to the evidence brief

This evidence brief mobilizes both global and local research evidence about a problem, three elements of a potentially comprehensive approach 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, which would have required the authors of the brief to make judgments based on their personal values and preferences, and which could pre-empt important deliberations about whose values and preferences matter in making such judgments.

The preparation of the evidence brief involved five steps:

1) convening a Steering Committee comprised of representatives from the partner organizations, key stakeholder groups, and the McMaster Health Forum;
2) developing and refining the terms of reference for an evidence brief, particularly the framing of the problem and three elements of a potentially comprehensive approach 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, approach elements and implementation considerations;
4) drafting the evidence brief in such a way as to present concisely and in accessible language the global and local research evidence; and
5) finalizing the evidence brief based on the input of several merit reviewers.

The three elements of a comprehensive approach for addressing the problem were not designed to be mutually exclusive. They could be pursued simultaneously or in a sequenced way, and each element could be given greater or lesser attention relative to the others.

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.

In addition to these developments, and in some cases because of them, the health system in Ontario faces several challenges in trying to evolve alongside the shifting needs of the population. For instance, ensuring timely access to care in the province continues to prove difficult: while most Ontarians report having a family physician, only 44% are able to see their family physician on the same day or next day when they are sick, and 56% of Ontarians report difficulties in accessing care after hours.(1) Despite improvements in wait times for long-term care among community-residing older adults, wait times have increased among those waiting in hospital, and aggregate wait times nearly tripled for a long-term care placement in the decade between 2004 and 2014.(1;7) Furthermore, access to care isn't equitable given it varies depending on where in the province a person lives (e.g., rural versus urban), their socio-economic status (e.g., how much income they earn annually), their cultural heritage (e.g., whether they belong to an indigenous community), and their sexual orientation (e.g., whether they are lesbian, gay, bisexual, transgender or queer).(1;8-10)

With the Patients First initiative, which was first introduced by the Ministry of Health and Long-Term Care in late 2015 as a discussion paper and then introduced to the legislature in June 2016 as Bill 210, the *Patients First Act*, the Government of Ontario has proposed an ambitious health-system transformation agenda to help build on the aforementioned health and health-system successes, while ensuring challenges are overcome by focusing on four objectives: 1) improve access; 2) connect services; 3) support people and patients; and 4) protect the universal public health system.(11;12)

Underpinning much of what is presented in relation to the Patients First initiative is an understanding that the right mix, supply and distribution of health workers is needed to ensure Ontarians get the most appropriate programs, services and 'technologies' (including drugs) where and when they need them. However, the initiative has not explicitly considered key issues related to planning for the health workforce in order to meet these objectives.(13) Further complicating the situation is the fact that, in an established health system like Ontario's, health-system policymakers and planners are not starting with a blank canvas. In reality, they need to take into account at least three interrelated issues: 1) how health workforce planning has been pursued historically in the province; 2) the existing characteristics of the health workforce in Ontario that have emerged, at least in part, as a result of previous planning approaches; and 3) the factors that are most likely to shape health workforce planning efforts in the future. In the next three sections, we briefly cover each of these in turn.

Health workforce planning in Ontario

While the specific approaches adopted in Ontario to plan the health workforce are in some ways unique to the province, it is important to consider the broader context within which they have evolved over time. Specifically, a number of different approaches have been considered over the past three decades in Canada and elsewhere for health workforce planning, often in the context of perceived health workforce shortages.(14)

While consensus on a single 'correct' approach for modelling health workforce needs has yet to (or is likely to) emerge, efforts have been made over time to improve the technical approaches that underpin health workforce planning, resulting in at least three that are commonly referred to: 1) the utilization-based approach; 2) the needs-based approach; and 3) the effective demand-based approach.(15) The details and assumptions of each approach are summarized in Table 1.

Table 1: Established approaches to health workforce planning

Name of planning approach	Details of the approach	Assumptions of the approach
Utilization-based planning	The quantity, mix and population distribution of health workers are used as a baseline for estimates of future requirements	1) The current quantity, mix and distribution of services in the population are appropriate 2) The age- and sex-specific resource requirements remain constant in the future 3) The size and demographic profile of the population change over time in ways predicted by currently observed trends in age- and sex-specific rates of mortality, fertility and migration
Needs-based planning	Future requirements for health workers are estimated on the basis of the projected health deficits of the population, and the potential for addressing these deficits with the right mix, supply and distribution of health workers providing the right services	1) All healthcare and health promotion/disease prevention needs can and should be met 2) Cost-effective methods of addressing healthcare and health promotion/disease prevention needs can be identified and effectively implemented 3) Healthcare and health promotion/disease prevention resources are only used appropriately (i.e., to address relative levels of need)
Effective demand-based planning	Future requirements for health workers are estimated through the integration of healthcare and health promotion/disease prevention needs alongside important economic considerations (e.g., size and projected growth of the economy), and acknowledges that resource limitations mean that not all healthcare and health promotion/disease prevention needs can and should be met	1) Cost-effective methods of addressing healthcare and health promotion/disease prevention needs can be identified and effectively implemented 2) Healthcare and health promotion/disease prevention resources are only used appropriately (i.e., to address relative needs) 3) Implications of economic considerations can be used to prioritize which healthcare and health promotion/disease prevention needs should be met

Some jurisdictions have chosen to use a combination of these three approaches (e.g., in the United Kingdom a needs-based approach is adjusted for projected GDP and skill-mix requirements),(16) and in many jurisdictions (e.g., Australia, the United Kingdom, and the U.S.), national health workforce agencies have been established to lead health workforce planning and projections.

Historically, health workforce planning in Ontario has used the utilization-based approach, been initiated by the Ministry of Health and Long-Term Care, and primarily focused on the number and location of physicians in the province (e.g., estimating health workforce needs based on physician-to-population ratios). The main levers available to policymakers and planners for bringing about change have been physician remuneration and adjustments to training (e.g., medical school enrolment). In the last decade and a half, however, there have been a number of important shifts in this approach that has changed how workforce planning is approached today.

First, in 2007 HealthForceOntario was established by the Government of Ontario, bringing together relevant parts of the Ministry of Health and Long-Term Care and the Ministry of Training, Colleges and Universities (now the Ministry of Advanced Education and Skills Development) to focus on the recruitment and retention of health workers in the province, with a particular focus on ensuring the right number and mix of health workers are available.(17) The initiative also put in motion efforts to develop a database of standardized, consistent and comparable demographic, geographic, education and employment information on all of the regulated health professionals across Ontario to underpin future health workforce planning.(18)

Second, in the same year the Ministry of Health and Long-Term Care, in conjunction with the Ontario Medical Association, contracted the Conference Board of Canada to develop a needs-based planning approach for estimating physician workforce requirements in the province. The resulting process was used to project the future supply of physicians, while comparing it to population needs for health services, with the hope of quantifying the gap in services and the resulting requirement for physicians. Some limitations of the approach have since been acknowledged, including challenges with data availability and reliability, notably in areas of physician productivity.(19)

Third, in 2008 HealthForceOntario engaged in a similar process to develop a needs-based planning approach for nursing, working with seven of Toronto's largest acute-care agencies, to help plan for future enrolment requirements in nursing training programs, and to help formulate nursing workforce policies aimed at recruitment and retention.(20)

Overall, these developments have established an inter-ministerial focal point for health workforce planning in the province through HealthForceOntario, and have started to shift planning from a simple utilization-based approach to an increasingly comprehensive needs-based approach, and from a focus on physicians to a broader focus on the nursing workforce and other regulated health professionals. While these positive developments in how workforce planning is approached in Ontario should not be downplayed, achieving health system objectives such as those outlined in the Patients First initiative likely requires additional changes, particularly given the current health workforce in the province, and given the ways in which healthcare and health promotion/disease prevention initiatives are set to evolve further in the future. We now turn our attention to these issues.

An overview of the health workforce in Ontario

At the aggregate level, there has been a general trend towards an increase in the total number of practising health workers in Ontario during the last 10 to 15 years. Such high-level changes have occurred alongside a number of interdependent system-level changes, such as primary-care reform and shifts towards care provided by interprofessional teams and in community settings, and alongside societal factors, such as population growth. The situation becomes more complex as one focuses on particular professions and the system-level changes and societal factors affecting them.

Nurses are the largest group of regulated health professionals in the province. There were 137,525 nurses practising in Ontario as of 2015, of which 96,007 were registered nurses (RNs), 2,407 were nurse practitioners (NPs), and 39,111 were registered practical nurses (RPNs). However, despite being the largest group of professionals, according to numbers provided by the College of Nurses of Ontario in its 2014 annual report, the total number of nurses has been declining.(21). Specifically, from 2012 to 2014, the number of nurses in Ontario decreased by nearly 3% (from 153,059 to 148,678).(21) This decrease in the total number of nurses occurred despite a 17% increase in the number of NPs (from 2,020 to 2,362) and a 3% increase in the number of RPNs (from 38,845 to 42,018) over the same time period.(21) The overall trend can largely be attributed to a loss of nearly 8,000 RNs, which has been linked to the introduction of the Declaration of Practice requirement by the College of Nurses of Ontario.(22) This requirement stated that a member could only renew their nursing licence if they had practised in Ontario within the last three years, or had registered or been reinstated in the last three years.(22) In 2014, the total number of nurses continued to decrease, with a reported 12,273 nurses leaving the profession in that year.(22)

Analyses stretching back to 2004 have also shed light on a number of nursing workforce trends over the last decade. Specifically, the number of RPNs practising in Ontario rose by nearly 60%, and the number of NPs rose by 354% during the same period.(23) This occurred alongside more modest

increases in the number of RNs (12.1% growth from 2004 to 2015), who comprise a decreasing share of the total nursing workforce in the province, leaving Ontario with the lowest RN-to-population ratio in Canada.(23) Since Ontario's population rose 11.3 per cent over the period, RN employment roughly kept pace, while RPN and NP employment markedly exceeded population growth. As of 2015, Ontario had 711 RNs/NPs per 100,000 people (a decline from 725 in 2009), compared to 841 for the rest of the country. For Ontario to catch up with the rest of Canada, it would have to add an estimated 17,920 more RNs and NPs to its workforce, an increase of 18%.

The second largest group of regulated health professionals in Ontario is physicians, and unlike nurses, the number of physicians has been steadily on the rise. As of 2016, there were a total of 28,642 physicians in Ontario, of whom 49% were family physicians, and 51% specialists.(24) From 2010 to 2013 the number of family physicians increased by 13%, and the number of specialists increased by 11%. Furthermore, the number of family physicians increased from 85 per 100,000 in 2005 to 107 per 100,000 population in 2014.(25)

The number of physicians is expected to continue to increase in the short to medium term. Between 2005 and 2012, medical schools in Ontario reported:

- a 22% increase in first-year undergraduate enrolments;
- a 60% increase in first-year postgraduate trainees;
- a 67% increase in family medicine postgraduate trainees; and
- a 58% increase in specialist postgraduate trainees.(26)

Moreover there was a 48% increase in international medical graduates in residency training between 2005 and 2012, and between 2013 and 2014, there was a 5% increase in the number of medical certificates of registration issued by the College of Physicians and Surgeons of Ontario (CPSO), of which 40% were issued to internationally trained physicians – the largest number in the CPSO's history. Also, 22% of these certificates were issued to physicians trained in Canada but outside Ontario.(27) The Ministry of Health and Long-Term Care indicated in 2014 that there was no immediate need to increase the province's overall supply of physicians with the expectation that by 2025, physician supply will outpace anticipated service utilization by 8%.(8)

Several other developments have also contributed to the overall growth of the health workforce in Ontario. First, there have been increases in supply among some other cadres of regulated health professionals, with examples including:

- the number of midwives increased by 89% between 2008 and 2015, from 403 to 762;(18)
- the number of pharmacists increased by 32% between 2008 and 2014 (from 11,426 to 15,113);(18) and
- the number of dietitians increased by 27% between 2008 and 2015 (from 2,906 to 3,695).(18;28)

Second, some new health worker roles have been established in the province, with some of these roles, such as physician assistants, prompting concerns among some stakeholders.(29) Physician assistants were established in the province in 2007, and there are now more than 200 who support the work of physicians in interdisciplinary care teams in a range of healthcare settings, working alongside physicians, nurses and other health workers.(30) Third, there have been increases in the utilization of established non-regulated health workers, such as personal support workers in long-term care settings. At present, the role of personal support worker is becoming more formalized, with nearly 100,000 currently employed in Ontario, and with wages continuing to increase in line with government initiatives such as the Personal Support Worker Stabilization Strategy.(31;32)

While what is presented in this section may be viewed as a helpful starting point for thinking about the characteristics of the existing health workforce in Ontario, it is by no means reflective of how the workforce ought to be viewed for future planning purposes. This is because it is largely focused on the supply of particular health workers in the system, without taking into consideration the full range

of issues that need to be addressed when assessing current and future health workforce needs, which include (as we will return to in the elements section of the evidence brief):

1) the current and future health needs of the population;
2) the health system functions required in the various sectors (i.e., primary care, public health, etc.) to meet the needs of the population;
3) the models of service delivery that could be adopted to organize functions;
4) the health workers who could safely and effectively perform these functions; and
5) the range of factors that could change what constitutes the right mix of delivery models and health workers in a given context.

Future considerations for health workforce planning in Ontario

While the sections above are useful for understanding the historical development of health workforce planning as well as the current state of the health workforce in the province, it is the way in which the health system is evolving now and into the future that suggests why planning might need to be approached differently in the future. As mentioned earlier, the Government of Ontario is now attempting to introduce a transformative agenda through the Patients First initiative that will span a number of years and will likely result in significant changes in the way in which the health workforce is deployed across health sectors. Other, complementary agendas have been pursued for some time. In this section, we provide a brief description of the ways in which each sector might evolve in the future that could have significant implications for future health workforce planning.

One overarching change that could result from the implementation of Patients First should Bill 210 be turned into law as the *Patients First Act*, is the expansion of the role played by Local Health Integration Networks (LHINs).(11;12) Specifically, LHINs would be tasked with much more involvement at the sub-LHIN level, for planning and monitoring the integration of home and community care, primary care, specialty care and long-term care, while also engaging public health workers in supporting robust health-promotion and disease-prevention efforts. This integration signals a movement towards a regional, population-based

Box 2: Equity considerations

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

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

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

The evidence brief strives to address all Ontarians, but (where possible) it also gives particular attention to two groups:

- citizens and patients from particular ethno-cultural and linguistic groups; and
- citizens and patients in northern, rural and underserved communities.

Many other groups warrant serious consideration as well, and a similar approach could be adopted for any of them.

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

approach to healthcare and health promotion/disease prevention planning, which can have important consequences for health workforce planning.

In the home- and community-care sector, one of the major thrusts of Patients First is shifting many services traditionally provided in acute-care settings into home and community settings, which means that the complexity of care requirements will likely increase in both hospital and community settings.(12;31) As well, specific plans for how home and community care might change, as proposed in 'Patients First: A Roadmap to Strengthen Home and Community Care,' include increases to nursing-service maximums for home care which will likely result in increased demand for nurses.(31) All of these changes have implications for health workforce planning.

In the primary-care sector, the proliferation of interprofessional models of care (e.g., Family Health Teams, Nurse Practitioner-Led Clinics) has been underway for years, and these transitions are likely to continue. These changes are also likely to lead to a greater number and wider variety of health workers practising in interprofessional teams, ideally to their full scope of practice (and in some cases, with expanded scopes of practice, such as with independent pharmacist and RN prescribing), and a greater role for health workers employed in the sector (particularly physicians and RNs), in coordinating care for their patients across sectors.(33;34) Increasingly, health workers in the primary-care and home healthcare sectors will also be supported by a range of technologies (e.g., responding to emails and being available to field calls through initiatives like Telehealth Ontario), which will affect the dynamic of the health workforce by transforming the settings in which care is provided (as more services are delivered remotely), and the health workers required to provide services in these new settings.

In the specialty, rehabilitation and long-term care and public health sectors, additional changes are underway. In specialty care, hospitals will likely increasingly only serve very ill and/or complex patients, while more services traditionally provided in hospitals (e.g. cataract surgeries) will be provided in independent health facilities or 'out-of-hospital premises' (or in community-based specialty clinics more generally). In rehabilitation care, health workers will increasingly be pulled outside of the traditional system, into for-profit arrangements and into other sectors (e.g., worker's compensation). In long-term care, facilities may increasingly draw on human-resource supports from primary care (e.g., RNs, NPs, rehabilitation therapists and physicians). In public health, local public health agencies are likely to engage in services that are more proactive and coordinated with other sectors to ensure robust health promotion/disease prevention initiatives are established.(13;34)

Finally, in parts of the health system focused on specific conditions (e.g., cancer care and mental health and addictions), it is anticipated that services will become increasingly integrated with home and community care as well as with primary care, particularly as efforts are made to improve transitions between sectors, resulting in an increase in the number and range of health workers engaged in dual-sector practice.

While many of the changes outlined above are only anticipated at this point, the increasing levels of integration proposed by Patients First will be significant, should Bill 210, the *Patients First Act,* become law. This is highly important for how the health workforce is planned, as individuals will no longer receive services from, say, a single physician in one sector at a time. Instead the system is being designed to function as one integrated whole, and workforce planning will need to adjust to reflect this.

THE PROBLEM

Many challenges confront those engaged in health workforce planning, with the key dimensions of the problem being:

- the healthcare and health promotion/disease prevention needs of Ontarians are constantly evolving, which makes future health workforce requirements uncertain;
- current approaches to workforce planning do not reflect the realities of Ontario's changing health system;
- the way the health system is organized makes it difficult to plan for future health workforce needs; and
- political factors also make it difficult to plan for the health workforce over the long term.

Box 3: Mobilizing research evidence about the problem

The available research evidence about the problem was sought from a range of published and "grey" research literature sources. Published literature that provided a comparative dimension to an understanding of the problem was sought using three health services research "hedges" in MedLine, namely those for appropriateness, processes and outcomes of care (which increase the chances of us identifying administrative database studies and community surveys). Published literature that provided insights into alternative ways of framing the problem was sought using a fourth hedge in MedLine, namely the one for qualitative research. Grey literature was sought by reviewing the websites of a number of Canadian and international organizations, such as the Institute for Clinical Evaluative Sciences, Health Quality Ontario, Canadian Institute for Health Information, European Observatory on Health Systems and Policies, and Organisation for Economic Co-operation and Development.

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

The healthcare and health promotion/disease prevention needs of Ontarians are constantly evolving, which makes future health workforce requirements uncertain

As highlighted in the introduction to this evidence brief, factors such as the aging population, increase in the burden of chronic diseases and changing pattern of socio-environmental determinants of health in Ontario, have created a situation in which the healthcare and health promotion/disease prevention needs of citizens in the province are shifting. Moreover, there is growing recognition of the need to shift the approach to addressing these needs from one focused on illness, and what can be done in acute-care settings to address illness, to a broader conception of health and what can be done in a range of settings to promote and improve health. Shifts in needs and approaches to assessing needs make it challenging to determine what an appropriate health workforce should look like in the future.

Individual preferences for how care is delivered are also changing. For example, Ontarians with continuing care needs increasingly prefer to receive this care in their homes, while the family members and friends providing informal care in home settings are increasingly in need of alternate forms of support, such as homemaking and respite services.(35) Shifting care in such fundamental ways will have a significant impact on what constitutes the right mix, supply and distribution of health workers in the province.

Technological advances and the evolving nature of service delivery are also introducing challenges in defining future health workforce needs. Specific examples illustrating how rapid changes in service delivery may result in unintended effects on the health workforce, include:

- the discovery of an infective cause of peptic ulceration, which rendered the surgical procedure traditionally used to treat the condition redundant, and as a result many of the health workers involved in the procedure were no longer needed; and
- the development of laparoscopic techniques to replace open abdominal procedures that used to require a 10- to 12-day hospital stay, which has reduced the need for health workers who had been involved in such care.(36)

The influences of similar rapid technological advances have already started to shift the health system in Ontario – most notably in enabling many high-volume, low-risk surgical procedures, such as cataract surgery, to be moved out of acute-care settings and into community-based speciality clinics.(37)

While it is likely that uncertainties due to shifting healthcare and health promotion/disease prevention needs, changing preferences and technological advances will always be a challenge for health system policymakers and planners, the approaches adopted for health workforce planning in Ontario need to consider ways to ensure they are accounted for. Failure to do so could result in a misalignment between the health workforce we have in the province (the supply) and the needs of those the workforce is meant to serve (demand).

Recent data from Ontario suggest that uncertainties may also result in a misalignment between the supply of health workers and the extent to which the health system absorbs and integrates them. For example, the Auditor General of Ontario reports that as of 2013, only 64% of nurses were working full time, which was a drop from the 67% who were working full time in 2011, and below a ministry target of 70% full-time nurse employment rates.(38) Furthermore, a 2012 report on the nursing workforce prepared by the Ministry of Health and Long-Term Care and University Health Network reported a 5% vacancy rate across all sectors and staff groups. A more recent analysis of the nursing workforce has suggested that a decrease in RNs' share of total nursing employment in the province does not align with the workforce required to meet the goals of the Patients First Initiative in the context of increasingly complex patients requiring care across all sectors, which may indicate other misalignments between workforce supply and demand.(13) Similar challenges have been reported for specialist physicians across Ontario, despite a consistent increase in their supply. Specifically, close to 20% of newly trained specialists and sub-specialists surveyed in 2013 reported that they had no job placement lined up.(39) These problems have been at least partially attributed to the way the health workforce is planned, with suggestions to take a more comprehensive approach in the future that includes insights about how the economy is performing (i.e., effective demand), and how the health system is organized and will evolve (e.g., more interdisciplinary care), as well personal factors that affect individual motivation.(39)

Current approaches to workforce planning do not reflect the realities of Ontario's changing health system

While the many positive developments in health workforce planning in Ontario that were highlighted in the previous section of this evidence brief should not be discounted, Ontario currently lacks a provincial health workforce plan to align population health needs with system priorities while taking into account the full and expanded scopes of practice of all health workers (both regulated and non-regulated). Furthermore, current approaches to planning are not an accurate reflection of the realities of the province's evolving health system. There are at least two reasons for this: 1) new and emerging models of care are not accounted for in existing approaches to health workforce planning; and 2) the health workforce practising outside of traditional physician-led and hospital-based environments is expanding.

The first major challenge with current approaches to health workforce planning in Ontario is that they do not consistently account for new and emerging models of care in the system. Increasingly, programs and services are integrated across sectors (e.g., Health Links) and are delivered by a number of different types of health workers practising in interprofessional teams. Should the *Patients First Act* become law, it is highly likely that these types of changes will continue. However, existing approaches to health workforce planning are often focused heavily on planning for the physician and nursing workforce, without considering the full range of health workers who are involved in care alongside them (e.g., pharmacists and dietitians) in evolving and innovative models of care (e.g., Family Health

Teams, Nurse Practitioner-led Clinics and Community Health Centres in primary care). Furthermore, other non-regulated health workers (e.g., personal support workers are rarely incorporated into workforce planning approaches, despite their increasingly important roles in providing care within evolving service-delivery models – particularly in home and community care and long-term care. Also, despite the increasing role of informal/family caregivers in providing support for their loved ones at home (an issue that is often raised as a core challenge stemming from our rapidly aging population), their inputs into the system as part of the health workforce are rarely, if ever, acknowledged. Similarly, emphasis on supporting patient self-management, particularly in the context of chronic-disease management, is not considered in health workforce planning approaches, despite the growing focus on this dimension of care among health workers.(40)

The second major challenge is that there has been little, if any, consideration of how to plan for the supply, mix and distribution of other key health workers who provide important services not currently included in the 'core bargain' of publicly funded physician-provided and hospital-based services, such as dentists and pharmacists. Instead, the supply and distribution of these professionals is largely left up to market forces. For example, the distribution of pharmacists in the province is influenced by decisions made by the large pharmacy chains such as Shoppers Drug Mart and Rexall about where to establish their retail locations, rather than population health needs. As these health workers are increasingly considered integral parts of a fully integrated health system – and particularly community pharmacists who are now relied on to perform vital system functions such as delivering seasonal flu vaccines – it is likely that considering them in workforce planning models is a necessity.

The way the health system is organized makes it difficult to plan for future health workforce needs

Aspects of the governance, financial and delivery arrangements that characterize Ontario's health system also create challenges in planning for the future health workforce in the province.

Governance arrangements

At least four factors related to health-system governance arrangements in Ontario make planning for the future health workforce challenging. First, unlike 'command and control' systems such as the National Health Service in the United Kingdom where central governments have decision-making authority over many aspects of health-system planning, Ontario's 'core bargain' of private practice/public payment, combined with self-regulation, significantly restricts the policy levers available to policymakers and planners. Beyond changing how health workers are remunerated and organizations are funded, there are few policy levers that would enable policymakers and planners to implement new models of care over the long term (and thus yield predictable impacts on the need for different types of health workers).

The second factor related to governance arrangements in Ontario is that health workers in Canada have inter-jurisdictional mobility (i.e., it is easy for people to move if they aren't happy with working conditions in their own province), which means planning is more contingent on activity in other provinces than is currently accounted for. As highlighted earlier in this evidence brief, a significant number of newly licensed physicians in Ontario come from other provinces. While the meeting of First Ministers in 2003 established 'A Framework for Collaborative Pan-Canadian Health Human Resources' (to which Ontario has contributed and in which it continues to participate), health workforce planning remains a provincial endeavour, meaning inter-jurisdictional factors are not consistently considered in health workforce planning approaches.

The third governance factor relates to the regulation of health professions. Specifically, regulation is competency- and task-focused (i.e., defining the competencies that professionals must have and the

tasks that they can and can't perform), rather than practice-focused (i.e., defining how health workers can and will perform their tasks alongside other professionals). Furthermore, regulation does not fully take into account the variability in the types of care each professional may be required to provide, depending on where she/he is working (e.g., rural versus urban) and with whom (e.g., team-based models versus solo practice). This can create rigid boundaries within which different regulated health professionals practise, despite the need for flexibility in the face of a continually evolving health system that needs to accommodate regional differences.

The fourth governance-related factor is that training isn't always aligned with scope of practice, given the 'controlled acts' outlined in the *Regulated Health Professionals Act*. This creates situations in which many health workers are 'over-trained and under-practising,' resulting in an inefficient use of skills. Pharmacists in Ontario provide a good example of this point. Specifically, Ontario has very innovative pharmacist training at the Canadian Council for Accreditation of Pharmacy Programs (CCAPP) level. However, the Ontario health system does not enable pharmacists to practise to the level at which they're trained in these programs. While the skills obtained in these programs equips graduates to prescribe medication, pharmacists' regulated scope of practice continues to limit significantly their ability to do so in Ontario.(41)

Financial arrangements

There are two important factors associated with health-system financial arrangements in Ontario that also make it challenging to plan for the future health workforce in the province. First, as has already been mentioned several times in this evidence brief, the Government of Ontario relies primarily on financial policy levers (particularly organizational funding and provider remuneration) to bring about system-level change, and is constrained in how these levers are used in the province. This makes it difficult to firmly establish new models of care for the future that can then be used to inform health workforce planning. For example, primary-care reform initiatives in the province have had to rely on shifts in physician-remuneration models, from fee-for-service to blended mechanisms, which, despite some successes, have proven challenging to scale up fully for all physicians.

The second factor related to financial arrangements is the separation between planning and oversight of remuneration for physician services through the Ontario Health Insurance Plan (OHIP), and the planning and oversight for the funding of other health services provided in the province (which is mostly done by Local Health Integration Networks). Given the integration of physicians with many facets of the health system, this arrangement creates challenges in budgeting, but also in planning for the health workforce. For example, care provided in a hospital setting may be optimized by the addition of a new physician assistant working with a specialist or an NP providing care previously provided by a specialist. While more patients could be seen or care could be less expensive with these changes, a hospital is unlikely to make such a decision given physician assistants and NPs have to be paid through the hospital budget, whereas specialists do not. Misaligned incentives can make it difficult to integrate different health workers into preferred models of healthcare and health promotion/disease prevention.

Delivery arrangements

With respect to health-system delivery arrangements in Ontario, three factors create challenges for health workforce planning. The first factor is related to the introduction of new models of care considered earlier in this section. Specifically, existing planning approaches not only overlook how new team-based approaches to delivering care across sectors will affect health workforce needs, they also fail to consider the impact of scaling up these new approaches.

Second, much of the technical work related to health workforce planning for Ontario is done by individuals who work outside of government and are dependent on volatile sources of funding (e.g., government contracts and research grants). There is limited capacity within government to undertake sophisticated health workforce-modelling exercises, and skilled in-house staff may have many competing priorities that don't allow them to do this work to a high standard. As such, ensuring a consistent focus on the development and on-going refinement of approaches to health workforce planning is difficult.

The third factor relates to difficulties in planning for the proper distribution of health workers. For example, the private practice/public payment core bargain has established physicians as 'small business owners' who in many cases have control over the supply of their labour, including how many hours they work, where they work, and when they retire, in a way that can be relatively independent of demand for their labour. It is then not surprising that the current distribution of physicians across the province does not align with population needs. For example, in 2011 only 5% of physicians were practising in rural areas, despite 14% of the population living in such communities. Efforts to remedy this situation include the Rural Family Medicine Locum Program (providing temporary short-term replacement coverage for practising rural physicians), the Northern and Rural Recruitment Initiative (providing financial incentives for establishing and continuing practice in select rural Ontario communities), and limiting the entrance of new physicians into Family Health Networks and Family Health Organizations to areas of high physician need.(42;43) Other initiatives include providing greater opportunities for other regulated health professionals working to a full or expanded scope of practice (e.g. independent RN prescribing).(44)

Political factors also make it difficult to plan for the health workforce over the long term

In addition to the problems described above, two dimensions of the political process related to health policy development in Ontario are also worth highlighting as potential challenges to future health workforce planning. First, decisions about the health system (and the health workforce) are typically made by politicians operating with short time horizons (i.e., four-year election cycles) and under significant pressure from provider (i.e., interest) groups. Second, a history of 'turf wars' is often acknowledged in Ontario,(45) wherein scopes of practice are contested to protect professional interests, rather than to efficiently meet health needs. Taken together, these political dynamics create additional challenges to health workforce planning in the province.

Additional equity-related observations about the problem

While the challenges outlined in this section of the brief have important implications for whether the system is able to meet the healthcare and health promotion/disease prevention needs of all Ontarians, a number of aspects of these challenges may be particularly salient for the groups prioritized in this brief (citizens and patients from particular ethno-cultural and linguistic groups and in northern, rural and underserved communities). First, as models of care continue to evolve in Ontario, it will become increasingly important to introduce mechanisms that ensure the right supply, mix and distribution of health workers are available to serve the needs of traditionally marginalized communities. For example, in primary care, many of these communities have been served by community-governed models of primary care including Community Health Centres and, in the case of indigenous populations, Aboriginal Health Access Centres. However, newer primary care models such as Family Health Teams have received the bulk of attention from policymakers and planners in recent years, but don't have an explicit mandate to meet the needs of marginalized communities. Health workers with the potential to serve these communities could be discouraged from working in models that are not as heavily emphasized by government given they may be perceived to be associated with lower pay and fewer supports.

Second, the challenge of ensuring access to services for rural and remote communities is extremely important in Ontario. This issue is at least partially related to a distribution of health workers that is skewed to urban settings, and mechanisms to overcome this challenge have to be developed, including innovative service delivery models and/or the adoption of the right mix of policy levers to ensure the appropriate supply, mix and distribution of health workers.

Citizens' views about key challenges related to planning for the future health workforce in Ontario

To complement the data and evidence in this evidence brief, three citizen panels were convened, with one convened in Sudbury on 18 August 2016, a second convened in Ottawa on 10 September 2016, and a third convened in Hamilton on 17 September 2016). Fifteen ethnoculturally and socio-economically diverse citizens participated in each of the first two panels, and they were provided with a streamlined version of this evidence brief (available on the McMaster Health Forum's website) to support their deliberations. In their discussion about the key challenges related to health workforce planning in Ontario, a number of key values emerged:

- the need for continued emphasis on universal access and equity;
- sufficient availability and accessibility of health services;
- increasing coordination between health providers;
- transparency and accountability in decision-making;
- resource stewardship and prioritization of cost-effectiveness and efficiency; and
- increased recognition of patient preferences, satisfaction with services, and level of engagement.

The key challenges identified by citizens are summarized in Table 2.

Table 2: Summary of citizens' views about challenges

Challenges		Description
Challenges related to planning for the future health workforce	Poor management of the supply, mix and distribution of health workers in Ontario and lack of clarity about their responsibilities	• Participants expressed frustration with a number of problems related to the supply, mix and distribution of health workers, including: o an unequal distribution of health workers across Ontario; o limited coordination across professions (or health worker categories); o a lack of clearly defined roles and responsibilities of health workers that maximize their scope of practice; and o a lack of proper training for, and ongoing assessments of, non-regulated health workers, both in their clinical competencies and in their broader approach to care.
	Failure to adequately support informal/family caregivers and patients as partners in care delivery	• A number of problems related to the role of patients and their informal/family caregivers were raised by participants, including: o there is an increasing reliance on informal/family caregivers to provide a range of necessary supports, particularly in the home (e.g., helping with 'activities of daily living'); o there are few services available to support individuals who act as informal/family caregivers in the system; and o despite their increasing roles in the system, informal/family caregivers are not formally considered part of the health workforce, and workforce-planning initiatives seem to have omitted them from consideration. • Several participants emphasized that, notwithstanding the challenges with the health system, there continues to be a need to recognize personal responsibility for one's own health.
	Little patient engagement and poor integration of patient and caregiver preferences in decision-making about who provides care, and what types of services are provided	• Participants felt that the following issues were particularly pressing with respect to patient and informal/family caregiver engagement in decision-making: o patients and their informal/family caregivers are increasingly expected to fill gaps in the system and manage their own conditions (e.g., when inadequate home-care services are available to support disease management), but they are not engaged in their own care process in ways that enable them to do this effectively; o there is insufficient acknowledgment of patient preferences for the health worker(s) they receive care from; o there is insufficient consideration of the types of programs and services (and drugs when considering brand name versus generic options) patients want to receive from their preferred provider; and o increasingly, patients and their informal/family caregivers are expected to advocate for themselves to ensure they receive appropriate high quality care.
Challenges related to broader health-system issues	Lack of accountability and transparency across all levels of the system	• Participants felt that the following challenges existed with respect to accountability: o the 'social contract' among the public, health workers and government has been compromised; o the health system has evolved more around the ways in which care is paid for than the needs of the patient; o health workers are not held accountable for the quality of care being delivered;

		○ non-regulated health workers (specifically personal support workers involved in home care) are not held accountable for the services (or lack of services) they provide; and ○ there is a lack of patient education and insufficient emphasis on public communication, which contributes to a lack of patient trust towards health worker and government decisions. • Participants also discussed a lack of transparency at the political level, specifically with regards to: ○ decision-making about what services to fund; ○ negotiations of health workers' contracts; and ○ use of public funds.
	Differential access, availability and quality of services across Ontario	• Participants raised a number of issues related to access and availability of services in Ontario, which included: ○ inequities in access between rural and urban communities, and between Ontario and other provinces such as Quebec; ○ determination of access by location and ability to pay, rather than individual health needs; ○ long wait times and lack of sufficient physical resources to meet patient demands (e.g., hospital beds); ○ acute conditions overly emphasized in delivering care, with less acute and preventive concerns routinely overlooked; and ○ variations in quality across the system and a lack of consistent quality-control mechanisms.
	No financial accountability and lack of clarity around resource stewardship	• Financial accountability and clarity around resource stewardship were also associated with a number of challenges highlighted by participants, including: ○ there are financial pressures in the system and threats to affordability in the future, with a need to focus on cost-effectiveness and efficiency in government spending; and ○ public spending has not prioritized allocations to patient care and front-line workers, but to administrative and executive costs.
	Sluggish adoption and integration of innovative technology to improve care	• With respect to taking advantage of innovative technology, participants indicated that they believed: ○ the adoption of innovative technology has been slow in the province, with the failure to integrate electronic health records serving as a particularly problematic example of a missed opportunity for significantly improving care; and ○ Ontario has not done enough to learn from other jurisdictions across the country and internationally about how best to adopt innovative practices and models of care.
	Need to consider the legacies of past policies	• Participants shared the impact of past policies and the ways in which these have contributed to inequities in health and limited access to services among indigenous groups, expressing their beliefs that there is a need to consider universal access to health services as being inclusive of traditional medicines and providers.

THREE ELEMENTS OF A POTENTIALLY COMPREHENSIVE APPROACH FOR ADDRESSING THE PROBLEM

Many approaches could be selected as a starting point for deliberations about an approach for planning for the future health workforce in Ontario. To promote discussion about the pros and cons of potentially viable approaches, we have selected three elements of a potentially comprehensive approach to workforce planning. The three elements were developed and refined through consultation with the Steering Committee and key informants who we interviewed during the development of this evidence brief. The elements are:

1) determine the current and future health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs;
2) establish future health workforce scenarios and the appropriate models of care that will meet population health needs while balancing effective demand; and
3) select the appropriate policy levers to meet health workforce planning goals.

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

Furthermore, during the development of the evidence brief, a number of key informants suggested that, while the elements taken together may constitute an ideal approach for planning for the health workforce, making decisions for the short-to-medium term may require prioritizing the elements so that the most practical approach is pursued first. As such, it could be the case that element 2 serves as the most logical starting point for discussion, given it doesn't require developing an entirely new health workforce planning approach by 'building from the ground up' in terms of re-conceptualizing how population needs are defined, and how we determine which functions are required to meet those needs (element 1). Instead, element 2 could serve as a pragmatic first step that enables planners to build on existing efforts

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

The available research evidence about elements for addressing the problem was sought primarily from Health Systems Evidence (www.healthsystemsevidence.org), which is a continuously updated database containing more than 5,200 systematic reviews and nearly 2,500 economic evaluations of delivery, financial and governance arrangements within health systems. The reviews and economic evaluations were identified by searching the database for reviews addressing features of each of the approach elements and sub-elements.

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 elements 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 relevance to the issue. (See the appendices for a complete description of these assessments.)

Being aware of what is not known can be as important as being aware of what is known. When faced with an empty review, substantial uncertainty, or concerns about quality and local applicability or lack of attention to equity considerations, primary research could be commissioned, or an element could be pursued and a monitoring and evaluation plan designed as part of its implementation. When faced with 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 element may want to search for a more detailed description of the element or for additional research evidence about the element.

to 'hit the ground running,' while plans are made to pursue element 1 over a much longer time horizon.

The principal focus in the remainder of this section is on what is known about these elements based on findings from systematic reviews. We present the findings from systematic reviews along with an appraisal of whether their methodological quality (using the AMSTAR tool)(9) is high (scores of 8 or higher out of a possible 11), medium (scores of 4-7) or low (scores less than 4) (see the appendix for more details about the quality-appraisal process). We also highlight whether they were conducted recently, which we define as the search being conducted within the last five years. In the next section, the focus turns to the barriers to adopting and implementing these elements, and to possible implementation strategies to address the barriers.

Citizens' values and preferences related to the three elements

The same three elements of a potentially comprehensive approach to planning the future health workforce in Ontario were included in the citizen brief that informed the citizen panels. These elements and related questions were used as a launching point for citizen deliberations on each of these elements. We have summarized the key values expressed in relation to each element, and citizen preferences for how to implement each element, in Table 3.

Table 3: Citizens' values and preferences related to the three elements

Element	Values expressed	Preferences for how to implement the element
Determine the current and future health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs	• Decision-making informed by high-quality data on the needs and preferences of Ontarians • Transparency in data collection and use • Equity of access to high-quality services that address health needs and align with the preferences of Ontarians (between rural and urban communities, and between English- and French-speaking communities)	• Account for current health priorities in caring for older adults, but recognize that health needs will change as the 'baby boomer' generation ages • Include data about how demographics will change in the province, including through the increase in new Canadians (both immigrants and refugees) • Ensure the process for determining population health needs is transparent by communicating with and educating the public • Engage patients and members of the public in the process of determining health needs through public consultations and surveys • Ensure that the needs of those with chronic conditions are specifically taken into account through a greater focus on community services and integrated clinics
Establish future health workforce scenarios and the appropriate models of care that will meet population health needs while balancing effective demand	• Accountability for providing quality care • Patient engagement • Recognition of patient preferences • Efficiency and continuity of care through coordinated services across health workers • Cost-effectiveness of services • Transparency in health worker responsibilities	• Consider patient preferences for models of care (and local differences in these preferences) • Enable better access to community-based care by encouraging team-based models of care and increasing the number and distribution of community-based health workers • Support greater coordination across sectors in the health system through electronic health records and integrated clinics • Clearly define health worker roles and responsibilities such that skill sets complement one another • Encourage the careful allocation of resources, prioritizing cost-effective services and models of delivery • Empower communities with a greater role in planning for the health workforce and ensure these plans are integrated with efforts at each of the regional and provincial levels

Select the appropriate policy levers to meet health workforce planning goals	• Patient engagement
	• Transparency in decision-making about changes to the system
		• Adjust policy levers that can support changes to the health workforce and improve the health system, including:
		  ○ updating the certification requirements for all health workers on a regular basis;
		  ○ making changes to medical curricula to include rural and remote area-specific education;
		  ○ making changes to the licensure of health workers trained outside Canada;
		  ○ regulating personal support workers and implementing ongoing monitoring, evaluation and reporting of the services they provide;

		○ introducing new methods of reimbursing providers that emphasize quality of care; ○ increasing recruitment of health workers from rural areas; ○ increasing attention paid to staff-retention initiatives in rural and remote communities; ○ adjusting the funding for rural locums to extend time commitment in rural communities; and ○ introducing changes to professional development and on-the- job training curricula for rural communities. • Ensure that sufficient supports are available for informal/family caregivers including: ○ tax breaks; ○ paid leave; and ○ therapy or support groups. • Engage patients in the process of planning for the future health workforce through: ○ establishing forums that enable patients' opinions to be voiced; ○ encouraging the development of other mechanisms for active participation; ○ introducing accountability mechanisms to ensure patient feedback is being acted on; ○ providing increased information and education to patients about their interactions with the health system; and ○ developing patient 'watchdogs' and other accountability mechanisms.

Element 1 – Determine the short-, medium- and long-term health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs

Beginning the process of health workforce planning by defining the health needs of the population is increasingly being acknowledged among experts as integral to the process,(36) and more generally, the idea that health system policymaking and planning should start with patient needs has taken root in Ontario with the introduction of Patients First.(11) As such, it makes sense that the first element of a comprehensive approach to consider for addressing the challenges described in this evidence brief is to clearly define the health needs of Ontarians today and into the future. Additionally, this element would also involve defining the types of healthcare and health promotion/disease prevention functions (e.g., programs and services) that are required to meet these needs – a process which can involve engaging medical and needs assessment experts, health workers, and health-system stakeholders to collectively establish the nature and scope of required healthcare and health promotion/disease prevention functions. Overall, element 1 is the first step in building a new process for future health workforce planning 'from the ground up,' which will require significant data, time and resources.

The sub-elements/stages of this process would include:

1) using population health data to develop dynamic models that can present a comprehensive picture of the short-, medium- and long-term health needs of Ontarians;
2) integrating models of population health needs with health-system data (including data about the health workforce) to project short-, medium- and long-term unmet health needs;
3) engaging medical and needs assessment experts to provide insights about the most cost-effective and feasible healthcare and health promotion/disease prevention interventions for addressing population health needs, and for reducing unmet needs; and
4) establishing deliberative processes that engage champions from health worker groups and other health-system stakeholders to collectively agree on which functions are most appropriately adopted by whom in order to meet population health needs.

Only one systematic review related to element 1 was identified, and it focused on the fourth sub-element (establishing deliberative processes). The review did not answer questions about effectiveness (or harms), cost-effectiveness or stakeholder views and experiences, although it did suggest that deliberative processes need to consider an appropriate meeting environment, mix of participants, and use of research evidence.(46)

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

Table 4: Summary of key findings from systematic reviews relevant to Element 1 – Determine the short-, medium- and long-term health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet these needs

Category of finding	Summary of key findings
Benefits	• No systematic reviews were identified that provided information about benefits
Potential harms	• No systematic reviews were identified that provided information about potential harms
Costs and/or cost-effectiveness in relation to the status quo	• No economic evaluations or costing studies were identified that provided information about costs and/or cost-effectiveness
Uncertainty regarding benefits and potential	• Uncertainty because no systematic reviews were identified o **Using population health data to develop dynamic health workforce**

harms (so monitoring and evaluation could be warranted if the option were pursued)	**planning models** ○ **Integrating models of population health needs with health system data** ▪ Engaging medical and needs assessment experts to provide insights about the most cost-effective and feasible healthcare and health promotion/disease prevention options • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review ○ Not applicable – no 'empty' reviews were identified • No clear message from studies included in a systematic review ○ Not applicable
Key elements of the element if it was tried elsewhere	• **Establish deliberative processes that engage champions from health professional groups and health system stakeholders** ○ One medium-quality qualitative review was identified that found deliberative processes to be promising, particularly when the following features were included in the design: 1) appropriate meeting environment; 2) right mix of participants; 3) appropriate use of research evidence as an input (46)
Stakeholders' views and experience	• No systematic reviews were identified that provided information about stakeholders' views and experiences

As has already been indicated, a comprehensive approach to health workforce planning in Ontario could begin with this first element, with the first two sub-elements (defining population health needs) leading into the third and fourth (defining effective options and functions), before moving onto what we present next as element 2 (defining models of care).

In order to illustrate for readers what working through this process could look like in Ontario, Table 5 presents three sector-based scenarios that define the types of functions that might be required to address population health needs, examples of the models of care that might be adopted to organize the delivery of those functions, and the types of health workers who could perform these functions within these models.

In reviewing these scenarios as a way to make the processes discussed in the elements presented in this brief more concrete, readers are also encouraged to consider a number of variables that would likely influence which models of care and health workers would be most appropriate to meet population health needs:

- characteristics of the communities in which services are needed (e.g., urban versus suburban versus rural);
- characteristics of the populations served in communities where services are needed (e.g., demographics, ethnicity, language, and socio-economic status);
- existing organizational funding and professional remuneration arrangements (and potential for adjusting them);
- type and distribution of existing healthcare facilities/infrastructure in the region;
- type and distribution of available service providers in the region (e.g., not-for-profit and/or for-profit community organizations);
- range and scope of established programs in the region;
- supply, mix and distribution of health workers, informal/family caregivers and volunteers in the region;
- established professional scopes of practice;
- availability of technologies to support patients and health workers;
- government priorities; and
- projected economic growth and availability of financial resources.

Table 5: Illustrative examples of sector-based health workforce planning scenarios for Ontario

Sector	Examples of functions required to meet population health needs	Examples of models of care in which functions could be delivered in future	Examples of health workers/informal/family caregivers that could be engaged to perform functions within delivery models
Home and community care	Providing Ontarians living in their own homes with: • professional services that help with assessing their needs, providing them with care or helping them care for themselves (e.g., nursing care, physiotherapy, occupational therapy, speech-language therapy, social work); • personal-support services to help them with performing daily activities or safely managing them on their own (e.g., assistance with the tasks of daily living, bathing, dressing, eating, personal hygiene, toilet hygiene, travelling to and from appointments); • homemaking services (e.g., housework, planning and preparing meals, shopping for food and clothing, managing money, caring for children); and • end-of-life care (e.g., in-home visits and respite care).	• Geographically-defined (e.g., LHIN) oversight and planning of home and community care service providers and services • Regionally coordinated (e.g., sub-LHIN) home and community care eligibility assessments and referrals • RN-coordinated interdisciplinary professional, personal-support and homemaking service delivery	• NPs • RNs • RPNs • Physicians • Other regulated health professionals • Personal support workers • Informal/family caregivers • Volunteers
Primary care	Providing Ontarians with a first point of contact with the health system to support: • the acquisition of information and advice, including to help with finding local healthcare services; • setting health and healthcare goals appropriate to their condition and context; • timely access to care when sick (e.g., same- or next-day appointments, after-hours care, and 24/7 support); • proactive prevention of illness	• Online and telehealth access to information about care options • Community-governed models that serve socially disadvantaged and hard-to-reach populations (e.g., Community Health Centres) • Nurse practitioner-led interdisciplinary teams providing care to a roster of patients • Interdisciplinary (physician-led) primary-	• NPs • RNs • Physicians • Pharmacists • Midwives • Other health workers who could be involved in team-based primary care (e.g. chiropractors, complementary and alternative practitioners, dentists, dietitians, optometrists, social workers)

	and maintenance of health; • management of chronic disease and support for self-manage of chronic disease; and • care coordination with other health workers and sectors and supporting health-system navigation.	care teams providing care to a roster of patients • Interdisciplinary (physician-led) primary-care teams providing care to a geographically defined population of patients (e.g., at the sub-LHIN level) • Health hubs that provide an integrated district network of care, linked to local hospitals in rural areas	
Specialty care	Providing Ontarians who have specialty care needs with: • urgent care that fills the gap between primary and emergency care; • emergency health services (e.g., dispatch centres, land ambulances, air ambulances, base hospitals and emergency rooms); • specialty programs in over 60 areas (e.g., internal medicine specialties like cardiology and surgical specialties like orthopedics); and • complex continuing care (e.g., for people requiring long-term, medically complex care that cannot be provided at home or in long-term care facilities).	• Geographically-defined urgent- and emergency-care services coordinated around acute-care hospital hubs • Geographically-defined acute-care hospital hubs that coordinate and provide the full range of inpatient and outpatient specialty care, with an emphasis on multidisciplinary teams • Community-based specialty clinics to provide high volume/low-risk speciality procedures in outpatient settings (e.g., cataract surgery)	• Physicians (specialists) • NPs • RNs • Care coordinators • Paramedics • Physician assistants • Other health workers involved in specialty care

Element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand

The second element of a potentially comprehensive approach to health workforce planning in Ontario would logically extend from the efforts detailed in element 1. However, it could be the case that pressing short-term health workforce objectives require initially focusing on how new and emerging models of care that already exist, or are likely to be pursued, influence workforce needs. For example, determining how shifts to sub-LHIN regional planning and primary care accountability structures will change the required supply, mix and distribution of health workers, could be part of such a process.

As such, element 2 may also be seen as an alternative – in the short term – to the building 'from the ground up' approach of element 1, with a focus instead on adjusting existing processes in the province so that they accurately reflect the realities of the health system. In other words, this element builds on existing efforts to 'hit the ground running.'

Regardless of the starting point, this element could include one or more of the following sub-elements:
1) establish the models of care that will likely be pursued in the short and medium term in Ontario to meet the health needs of Ontarians;
2) define the mix of health workers involved in these models;
3) adjust existing needs-based approaches to health workforce planning in Ontario to account for the mix, supply and distribution of health workers involved in delivering care in new models; and
4) incorporate the full range of budgetary factors that may influence health workforce planning decisions, such as projected economic development and the price of various healthcare inputs (e.g., equipment, facilities, provider remuneration), to establish the parameters for incorporating effective demand principles into the process.

Table 6 presents a brief overview of how select jurisdictions across Canada and internationally have chosen to approach health workforce planning, including the key factors considered in the approach.

Table 6: Approaches to health workforce planning across Canada and internationally

Country and decision-making authority	Health workers targeted with approaches	Workforce planning approach
Canada - Alberta – Alberta Health (provincial government)	Nurses	Utilization-based approach with the following variables considered: • number and type of current health workers; • number of new and projected graduates; • projected immigration and mobility of health workers including internationally, within Canada and within Alberta; and • number of projected re-entrants to workforce, and net exits.(47;48)
Canada - British Columbia – Ministry of Health (provincial government)	All	Utilization-based approach with the following key variables considered: • number of staff, beginning of the year (FT, PT and casual); • recruitment gains (number of new graduates, international and interprovincial hires, employees returning from leave, and transfers into each occupational group); • employee losses (retirements or employees leaving the province, layoffs and dismissals, long-term disability, maternity, parental and educational leaves); and • staffing demand and carryover surplus (number of vacancies at the beginning of the year, calculated optimal staffing level, carryover surplus).(49-51)

Canada - Saskatchewan – Ministry of Health (provincial government)	All	Utilization-based/needs-based approach with the following key variables considered: • actual number of current health workers (in full-time equivalents); • projected number of incoming graduates (adjusted for type of professional); • number of projected terminations and retirements (based on the previous four years); and • current demand for services.(52)
Australia – Health Workforce Australia (central federal agency)	All	Utilization-based/needs-based approach with the following key variables: • graduates, return-to-practice and overseas students; • migration; • health workforce retirement and career change; • Medicare utilization statistics and population projections; • home and community care utilization data; and • scenario planning.(16;53-55)
Belgium – Federal/provincial government	All	Utilization-based/needs-based approach that considers the following key variables: • starting stock of the profession; • education; • activity level by age and gender; • estimates of migration; • entry of new graduates; • population health needs; and • societal/cultural evolution which may influence patient preferences.(56;57)
England – National Health Service, Centre for Workforce and Innovation (central planning agencies)	All	Needs-based combined with effective demand (adjustments for GDP), with the following variables considered: • regional variation; • scenario modelling; • skill mix; • cost profiles; and • future demand forecast through pathway models.(16;54;57)
France – National Observatory of Health Professionals (shared between central and regional agencies)	All	Utilization-based approach with the following variables considered: • stock of nurses; • entry and exit rates to labour force; and • proportion with mid-career changes.(16;54;58)
New Zealand – Health Workforce New Zealand (central government)	All	Needs-based approach, considering the following key variables: • population health needs; • functions and health workers required to meet population health needs; • qualitative health workforce 'intelligence', including care delivery scenarios developed by engaging health professional champions in order to establish the most likely models of care; and • quantitative health workforce data.(36;54)
United States – Department of Health and Human Resources (federal government) and state governments	Physicians	Utilization-based approach with adjustments for non-physician clinicians, considering the following key variables: • graduates and training positions; • workforce exit rate; • population; • utilization of services; and • distribution and quantity of non-physician clinicians.(16;59)

Only two reviews were identified that related to element 2, and they provided no clear indications about benefits, potential harms, costs and/or cost effectiveness, key features that would determine the element's likely success when implemented in a new setting, or stakeholder views and experiences. The two reviews identified (one that was medium quality and one that was low quality) did, however, establish that there is inconclusive evidence about the use of staffing ratios for health workforce planning, and few attempts to study the influence of health workforce information systems.(60)

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

Table 7: Summary of key findings from systematic reviews relevant to element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand

Category of finding	Summary of key findings
Benefits	• No systematic reviews were identified that provided information about benefits
Potential harms	• No systematic reviews were identified that provided information about potential harms
Costs and/or cost-effectiveness in relation to the status quo	• No economic evaluations or costing studies were identified that provided information about costs and/or cost-effectiveness
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option were pursued)	• Uncertainty because no systematic reviews were identified o **Establish the models of care that will likely be pursued in the short and medium term in Ontario to meet the health needs of Ontarians** o **Define the mix of health workers involved in models of care** o **Incorporate the full range of budgetary factors that may influence health workforce planning** • Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review o Not applicable – no 'empty' reviews were identified • No clear message from studies included in a systematic review o **Adjust existing needs-based approaches to health workforce planning in Ontario to account for the mix of health workers involved in delivering care in new models** ▪ One recent medium-quality review found inconclusive evidence to support the use of staffing ratios in medical practice, however there was some indication that it could assist in health service planning (61) ▪ One recent low-quality review reported limited documentation on the use of human resources information systems for planning health human resources (60)
Key elements of the element if it was tried elsewhere	• No systematic reviews were identified that provided information about the element if it was tried elsewhere
Stakeholders' views and experience	• No systematic reviews were identified that provided information about stakeholders' views and experiences

Element 3 – Select appropriate policy levers to meet health workforce planning objectives

The third element of a potentially comprehensive approach to health workforce planning in Ontario is to select the appropriate policy levers to ensure the right mix, supply and distribution of health workers exist to meet system goals. There are numerous approaches that could be adopted within this element, and here we draw on six broad categories of a framework developed to guide policymakers and planners in making decisions about the health workforce.(62) Specifically, in pursuing element 3, any one or more of the following types of policies could be pursued:

1) changes to the capacity and mix of practising health workers in the system (e.g., through adjustments to professional school admission criteria, the size of entering classes or curriculum);
2) changes in the information provided to students and practising health workers that may influence where, what and how they practise (e.g., sharing information about anticipated community needs, career opportunities, and the context of practice);
3) changes in how organizations are funded, and individual health workers remunerated, to influence where and how they practise (e.g., adjusting fee levels to increase the income of a specific type of provider such as a rural primary-care physician);
4) changes in the examination, licensure, certification and regulation processes to make it easier/harder for certain health workers to practise (e.g., removing licensure barriers to enable quicker transitions for foreign-trained health workers to practise in the province);
5) changes to training curricula; and
6) changes to planning approaches and policies that affect spatial location (e.g., introducing regional distribution polices that affect the rules dictating provider hospital privileges).

This element could also include two additional sub-elements:

1) a rigorous approach to monitoring the implementation and evaluating the impact of policies (and the new models of care that emerge as a result) at regular intervals over time to determine whether they are achieving their goals; and
2) iteratively adjusting policies and models of care based on the insights gained from monitoring and implementation.

Table 8 below serves as a continuation of Table 6 by providing an overview of the mix of policy levers adopted by a number of jurisdictions in Canada and internationally in pursuit of their health workforce planning objectives.

Table 8: Policy levers adopted across Canada and internationally to achieve health workforce planning objectives

Country and decision-making authority	Key policy levers adopted in pursuit of health workforce planning objectives
Canada - Alberta – Alberta Health (provincial government)	**Financial** • Changes to how organizations are funded and health workers are paid o Implementing bursary support to assist students with relocation to rural areas o Educational funding for nurses pursing nursing post-baccalaureate level **Delivery** • Changes in the capacity and mix of health workers o Introduction of advanced practice nurse anesthetists and advanced practice respiratory therapists in rural areas o Increase the number of clinical training places in rural areas • Changes to training curricula o Increase the number of common courses for health workers while training to promote interprofessional networks (47;48)
Canada - British Columbia – Ministry of Health (provincial government)	**Governance** • Changes to licensing and regulation o Creation of Practice Ready Assessment - British Columbia to facilitate recruitment of internationally trained health workers **Delivery** • Change in the capacity and mix of health workers o Development and expansion of Northern Medical Program at the University of British Columbia • Changes in training curriculum o Increase focus on hands-on, practical skills in nurse transition programs • Changes to planning approaches that affect spatial location o Expansion of regional distribution policies for nurses and allied health workers **Implementation strategies** • Changes in the information provided o Encourage the replacement of solo and co-located practices with fully realized team-based family practices (49-51)
Canada - Saskatchewan – Ministry of Health (provincial government)	**Financial** • Changes to how organizations are funded and health workers are paid o Develop bursaries for First Nations individuals entering the health workforce o Develop provider remuneration schemes that reward collaborative work **Delivery** • Changes in the capacity and mix of health workers o Target aboriginal students for admittance into health science programs o Target rural students for admittance into health science programs o Establish a mobile group of interprofessional, collaborative health workers who can deliver services to rural and remote areas • Changes to the training curricula o Provide specific training programs for rural locations o Develop additional training models in traditional knowledge and culturally appropriate practices **Implementation strategies** • Changes in the information provided o Provide increased information on the roles and responsibility of diverse health workers to prepare health workers to work in interdisciplinary practices o Disseminate information and on-going professional development in patient-centred care (52)
Australia – Health Workforce Australia (central federal agency)	**Governance** • Changes in licensing and regulation o Supported stay of international medical students and allow medical registration **Financial** • Changes to how organizations are funded and health workers are paid o Fee subsidy for nurses and freeze on nurse tuition fees o Additional funding for general practitioners **Delivery** • Changes to capacity and skill mix of health workers o Opening new medical schools to increase number of graduates o Limits placed on number of specialty training spots to encourage general practice (16;53;55)

Belgium – Federal/provincial government	**Financial**
	• Changes to how organizations are funded and health workers are paid
	  o Increasing remuneration of general practitioners to better align with that of specialist physicians
	Delivery
	• Changes to capacity and skill mix of health workers
	  o Increase in the number of training places for both medical schools and nursing education
	  o Creation of a new profession (advanced practice nurses and NPs)(54;56;57)

England – National Health Service, Centre for Workforce and Innovation (central planning agencies)	**Governance**
	• Changes in licensing and regulation
	  o Expanding the role of nurses to include prescribing privileges
	Financial
	• Changes to how organizations are funded and health workers are paid
	  o Incentives to encourage choosing general practice
	Delivery
	• Changes to the capacity and skill mix of health workers
	  o Reduction in the number of medical school admission places by 2%
	  o Reduction in the number of training places for adult nurses between 2004-2012; recent (2012) opening of places in response to shortage concerns
	• Changes to workload and workplace conditions
	  o Introduction of flexible carers scheme for working (54;57)

France – National Observatory of Health Professionals (shared between central and regional agencies)	**Governance**
	• Changes to licensing and regulation
	  o Increase in retirement age and changes to pension plans' eligibility efforts to prolong health workers' work life
	Delivery
	• Changes to capacity and mix of health workers
	  o Increasing number of places in both medical and nursing schools
	  o Increase in the number of training places for general medicine; many places however have gone unfilled
	  o Creation of new types of health workers (advanced practice nurses and NPs)
	• Changes in planning approaches that affect spatial location
	  o Use of regional quotas for health workers (16;57)

New Zealand – Health Workforce New Zealand (central government)	**Governance**
	• Changes in licensing and regulation
	  o Expanding the scope of diabetes nurses, dietitians and pharmacists to prescribe select common medications
	Financial
	• Changes to how organizations are funded and health workers are paid
	  o Subsidy for health workers working in hard-to-staff communities
	Delivery
	• Changes to the capacity and skill mix of health workers
	  o Increased recruitment of medical trainees into general practice
	  o Creating a new specialization for nursing in gerontology
	• Changes in training curriculum
	  o Creation of regional training hubs to align medical education and training
	  o Streamline learning through proposed merging of disparate qualifications into health science and technology degree, diplomas and certificates
	  o Adapting general practitioners education program to align with new models of care (63)

United States – Department of Health and Human Resources (federal government) and state governments	**Governance**
	• Changes to licensing and regulation
	  o Planned change requirement for advanced practice nurses to hold a Doctor of Nursing Practice
	Delivery
	• Changes to capacity and mix of health workers
	  o Increase in the number of medical school and nursing school places available
	  o Increase in the number of residency training spots, notably for general medicine
	  o Increase in the number of RN programs
	Implementation strategies
	• Changes to information provided
	  o Promotion of nursing profession (16;59)

While a number of reviews were identified related to the various sub-elements (i.e., policy levers) included in element 3, there were very few that provided definitive conclusions about the benefits, potential harms, costs and/or cost-effectiveness, key features that would need to be considered during implementation, or stakeholders' views and experiences. Additionally the majority of the reviews identified were low- or medium-quality and many were older (i.e., the last year the literature was searched was more than five years ago). However, the following broad insights might be gained from the reviews that were identified:

- remuneration plays an important role in influencing health workers' behaviour, but it is only one factor among many others (e.g., personal and lifestyle) that matter in decisions about where to practise;
- training health workers from rural backgrounds in rural settings is a promising approach for attracting and retaining the health workforce in rural areas; and
- it is important to keep health workers engaged to ensure they are appropriately acknowledged, supervised, involved in governance and decision-making, and involved in education and training.

A summary of the key findings from the synthesized research evidence is provided in Table 9. For those who want to know more about the systematic reviews contained in Table 9 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 3.

Table 9: Summary of key findings from systematic reviews relevant to Element 3 – Select the appropriate policy levers to meet health workforce planning objectives and achieve health system goals

Category of finding	Summary of key findings
Benefits	• **Changes to the capacity and mix of practising health workers in the system** o One recent medium-quality review found frequent supervision, incentives, community involvement and continuous training led to enhanced knowledge and performance of community health workers (64) o One recent low-quality review found that investing in rural health schools and rural training opportunities was important to sustaining and recruiting skilled workforce in rural areas (65) • **Changes in the information provided to students and practising health workers that may influence where, what and how they practise** o One older, low-quality review found that providing information sessions in conjunction with other recruitment interventions to improve amenities and reduce social isolation may be effective to increase recruitment to rural areas (66) • **Changes to how organizations are funded and individual health workers remunerated to influence where, what and how they practise** o One older medium-quality review found that payment incentives were effective at enhancing job satisfaction, worker performance and motivation, while increased salaries could motivate workers to improve work quality (67) o One older low-quality review found that compensation was a key factor in recruitment and retention of home support workers, with low wages, lack of wage parity and limited benefits acting as a disincentive for entering the profession (68) • **Changes to planning approaches and policies that affect spatial location** o One older medium-quality review found that, while more research is needed for a definitive conclusion, training students from rural backgrounds for rural service may result in a greater likelihood of rural practice, while financial incentives and bonding schemes may also contribute to improving retention in rural areas (69)
Potential harms	• No systematic reviews were identified that provided information about potential harms
Costs and/or cost-effectiveness in relation to the status quo	• No economic evaluations or costing studies were identified that provided information about costs and/or cost-effectiveness
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be	• Uncertainty because no systematic reviews were identified o **Changes to training curricula** • Uncertainty because no studies were identified despite an exhaustive search as part of a

warranted if the option were pursued)	systematic review o Not applicable – no 'empty' reviews were identified • No clear message from studies included in a systematic review o **Changes in the information provided to students and practising health workers that may influence where, what and how they practise** ▪ A recent, high-quality review found that education and training for health workers were promising strategies for improving cultural competency among those providing services to indigenous populations, although no firm conclusions could be drawn given methodological weaknesses of the included studies.(70) ▪ Two older low-quality reviews examining recruitment to underserved areas were unable to recommend a specific practice for improving attraction and retention in rural areas and in low- and middle-income settings (66;68) o **Changes to how organizations are funded and individual health workers remunerated to influence where, what and how they practise** ▪ One recent review of medium quality (67) was unable to find studies to determine whether financial incentives restrict movement of workers between the public and private sectors, while two older reviews of low quality (66;68) were unable to determine with certainty whether financial incentives acted as effective recruitment interventions in rural and underserved areas o **Changes to the examination, licensure, certification and regulation process to make it easier/harder for certain health workers to practise** ▪ One recent medium-quality review found mixed evidence about how well a range of governance mechanisms created change in the health workforce, although a number of approaches were promising, including: 1) shared governance, which had positive effects on empowerment, job satisfaction, interprofessional relationships and decreased turnover; 2) Magnet accreditation could improve nursing staff morale and job satisfaction, and reduced staff turnover; and 3) clinical governance and training for quality improvement could lead to greater support for quality improvement (71) ▪ One older high-quality review found insufficient evidence about how pre-licensure education influenced health workforce outcomes and worker supply (72) o **Changes to planning approaches and policies that affect spatial location** ▪ One older low-quality review found that many strategies exist to attract and retain health workers to remote rural areas, including recruitment and training for rural practice, incentives, compulsory services and improving living and working conditions, but most strategies do not comprehensively address the full range of factors that influence practice decisions, and there is limited literature evaluating these strategies.(69) Another older low-quality review found very limited information about how governance can affect the distribution of the health workforce (73)
Key elements of the policy option if it was tried elsewhere	• **Changes to the capacity and mix of practising health workers in the system** o One recent medium-quality review examined the contextual factors that affected community health workers' performance, and found that a key barrier to effective use of community health workers was a lack of recognition by system authorities,(64) and another recent medium-quality review found that, in addition to supervision, incentives and community involvement, continuous training and education led to enhanced performance of community health workers (74) o One medium-quality review found that the public health workforce in the United States had a gap in health workers and suggested that these could be filled by the development of infrastructure to support continuous education and training, as well as by increasing the role of academic institutions in preparing professionals in this field (75)
Stakeholders' views and experience	• No systematic reviews were identified that provided information about stakeholders' views and experiences

Additional equity-related observations about the three elements of a comprehensive approach

While only a small number of reviews were identified that addressed the elements considered in this brief, there were four identified in relation to element 3 that provided some insights about rural and underserved communities (one of the prioritized groups). In particular, the reviews primarily focused on what is known about strategies to recruit and retain health workers in rural, remote and underserved areas – a challenge which continues to exist in Ontario's northern and rural communities. The major findings from the reviews in relation to rural and underserved communities were:

- the evidence is unclear about whether financial incentives are effective recruitment tools;(66)
- while a number of approaches exist that can likely be used to attract and retain health workers to remote rural areas (e.g., recruitment and training for rural practice, incentives, compulsory services and improving living and working conditions), they are probably most effective when used together and in ways that address the multitude of factors motivating health workers;(69) and
- the health priorities specific to each individual community should be used to drive recruitment and training capacity for delivering health services in rural and remote communities.(65)

The most recent of these reviews also highlighted a number of key considerations related to ensuring better health equity in rural communities through the focus on models of care, access, education, training and supply of health workers, including:

- communities need to trust health services and be engaged in priority setting for service-delivery models to promote utilization of comprehensive primary-care services;
- building sustainable rural health services requires investment in rural schools of health, training programs and research; and
- health workers need to be trained and educated specifically for rural practice to develop the necessary skills, and also to ensure engagement with rural communities.(65)

A single recent and high-quality review was identified that focused on interventions to improve cultural competency in healthcare for indigenous populations, which aligns with element 3 and the sub-element focused on changes in the information provided to students and practising health workers that may influence where, what and how they practise.(70) While no firm conclusions could be drawn given the weak methodological quality of the included studies, interventions such as education and health worker training were found to be promising in terms of improving health worker confidence in providing care to indigenous populations, and in patients' satisfaction and access to services. None of the other reviews included in this evidence brief focused on citizens and patients from other particular ethno-cultural and linguistic groups, however, it is important to acknowledge that each of the elements should be considered in light of how the unique healthcare and health promotion/disease prevention needs of these populations are met. Planned efforts in the United Kingdom may provide important insights for how to address this issue in Ontario. Specifically, Prime Minister Theresa May and the Conservative Government recently announced a new scheme wherein public services (including health services) will be monitored to determine whether and how people from various ethnic backgrounds experience services differently.(76)

IMPLEMENTATION CONSIDERATIONS

A number of barriers might hinder implementation of the three elements of a potentially comprehensive approach to planning for the future health workforce of Ontario, which needs to be factored into any decision about whether and how to pursue any given element (Table 10). While potential barriers exist at the levels of health workers, organizations and systems (if not patients/citizens, who would not be directly affected by the elements in the short term, despite needing to be engaged in considering how each element may result in direct consequences for them in the medium and long term), perhaps the biggest barrier lies in the challenges associated with introducing a new approach to health workforce planning that can be accomplished in a timely way so that short- and medium-term needs are addressed. Specifically, pursuing element 1 as a logical first step to inform elements 2 and 3 would likely require significant investments in resources and time, and the process of engaging and getting buy-in from all relevant stakeholders could result in gridlock that would sidetrack progress. As such there is a risk with element 1 that no practical actions would be taken.

Table 10: Potential barriers to implementing the elements

Levels	Element 1 – Determine the current and future health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs	Element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand	Element 3 – Select the appropriate policy levers to meet health workforce planning objectives
Cross-cutting barriers	• Exogenous shocks, such as slow economic growth, may reduce effective demand • Despite the benefits of establishing a new approach to health workforce planning in Ontario, the elements presented may not be practical if adopted to meet short-term planning needs • Pursing an entirely new approach to health workforce planning may not be efficient or practical given the current economic and political climate		
Patient/ Individual	• n/a (patients/individuals not likely to be directly affected in the short term, although they would need to be engaged to consider potential consequences in the medium and long term)	• n/a (patients/individuals not likely to be directly affected in the short term, although they would need to be engaged to consider potential consequences in the medium and long term)	• n/a (patients/individuals not likely to be directly affected in the short term, although they would need to be engaged to consider potential consequences in the medium and long term)
Health workers	• None identified	• Agreeing on models of care and health worker roles within models of care, may be challenging given possible health worker 'turf wars' in Ontario	• Changes to existing licensure and regulation (e.g., scope of practice) may be met with resistance by health workers who perceive changes as negatively affecting their ability to practise • Changes to existing remuneration arrangements may be met with resistance by health workers who stand to lose income, or who perceive to be 'left out' as a result of new remuneration mechanisms
Organization	• None identified	• Agreeing on models of healthcare and health promotion/disease prevention, and the ways in which healthcare organizations in Ontario would need to align and structure themselves in order to support them,	• Coordinating changes to some types of health professional/worker training programs to meet health workforce planning goals may be challenging, given the autonomy of colleges and universities in combination with incentives to differentiate training programs to establish their competitive advantage • The diversity of organizational governance

		could be difficult	processes both within and across sectors may not be conducive to coordinated system-wide changes in regulation • Changes to existing organizational funding arrangements may be met with resistance by groups or organization who stand to lose revenues, or who perceive to be 'left out' as a result of new approaches to funding
System	• Additional time and resources are required to undertake a new exercise to establish health needs in Ontario • The technical capacity to pursue element 1 may not exist in a single location (e.g., Ministry of Health and Long-Term Care), and will likely require coordination across a number of centres both provincially and federally	• There may be limitations in data for forecasting outside of those who are working in fee-for service • It is difficult to confidently predict the future of healthcare and health promotion/disease prevention service-delivery models in Ontario, given the system is constantly evolving • Projections may not align with the realities of the system as it evolves, given uncertainties associated with the political process, socio-economic context, and technological advances	• Existing governance arrangements, and specifically the *Public Sector Labour Relations Transition Act,* 1997 (PSLRTA), require a number of conditions to be met for health workers to move from one sector to another (e.g. hospitals to community), which may undermine new policies o This is compounded by the fact that provider pensions tend to be rooted in the hospital sector, rather than system-wide and applicable to all, which could lock certain professionals into their existing locations of work • Primary-care remuneration is still primarily applied to physicians rather than to models of care

Despite the barriers highlighted above, a number of potential windows of opportunity exist for implementing the elements presented in this evidence brief (Table 11). Perhaps the most important of these windows is the introduction of Patients First, which has ushered Ontario into a phase where there are real opportunities for significant health-system transformation.

Table 11: Potential windows of opportunity for implementing the elements

Type	Element 1 – Determine the current and future health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet those needs	Element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand	Element 3 – Select the appropriate policy levers to meet health workforce planning objectives
General	• With Patients First, Ontario is entering into a phase where significant health-system transformation is possible, opening up an opportunity to make changes to existing health workforce planning processes • There appears to be a political appetite for change and needed improvements • Other jurisdictions are using a similar approach for addressing health-workforce challenges, providing an opportunity for learning from their successes and failures • Data capacity is growing in the province		
Element-specific	• The technical capacity exists in the province to develop models of current and future health needs	• New models of care are being considered in Ontario in all sectors, providing an opportunity to be innovative and flexible in establishing what the most appropriate approaches are for the province	• Funding and delivery reforms in the last decade have shown change is possible using the policy levers available to government

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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 each element, and sub-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.

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

The last three columns convey information about the utility of the review in terms of local applicability, applicability concerning prioritized groups, and issue applicability. The third-from-last column notes the proportion of studies that were conducted in Canada, while the second-from-last column shows the proportion of studies included in the review that deal explicitly with one of the prioritized groups. Similarly, for each economic evaluation and costing study, the last three columns note whether the country focus is Canada, or if it deals explicitly with one of the prioritized groups.

All of the information provided in the appendix tables was taken into account by the evidence brief's authors in compiling Tables 4-6 in the main text of the brief.

Appendix 1: Systematic reviews relevant to Element 1 – Determine the short, medium and long term health needs of the population, and describe the healthcare and health promotion/disease prevention functions required to meet these needs

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups
Use population health data to develop dynamic models	No systematic reviews identified	n/a	n/a	n/a	n/a	n/a
Integrate models of population health needs with health system data	No systematic reviews identified	n/a	n/a	n/a	n/a	n/a
Engage medical and needs assessment experts to provide insights about the most cost-effective and feasible healthcare and health promotion/disease prevention options	No systematic reviews identified	n/a	n/a	n/a	n/a	n/a
Establish deliberative processes that engage champions from health professional groups and health system stakeholders	Deliberative dialogues as a mechanism for knowledge translation and exchange in health system decision-making	The review presented a model of the key features of a promising approach (deliberative stakeholder dialogues) to engaging policymakers, stakeholders and researchers in addressing priority health system policy issues using the best available research evidence.(47) The authors suggested that the key features for this type of engagement include an appropriate meeting environment and mix of participants, and an appropriate use of research evidence. The types of effects intended by these initiatives include those that are short term and focused on the individual level, medium term and focused on the community/organizational level, and long term and focused on system-level changes.	2011	5/9	4/17	0/17

Appendix 2: Systematic reviews relevant to Element 2 – Establish the most appropriate models of care for meeting population health needs, and determine health workforce requirements, while balancing effective demand

Sub-element	Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups
Establish the models of care that will likely be pursued in the short and medium term in Ontario to meet the health needs of Ontarians	No systematic reviews identified					
Define the mix of health workers involved in models of care	No systematic reviews identified					
Adjust existing needs-based approaches to health workforce planning in Ontario to account for the mix of health workers involved in delivering care in new models	Evaluation of workforce ratios in health professions (61)	As healthcare is a complex and expensive industry, healthcare service providers must be able to provide effective and efficient services under fixed budget constraints. Service overlaps should be minimized, and staff allocation should be evidence-based and target population needs. This study aims to identify workforce ratios in allied health professions (AHPs) in hopes of determining appropriate levels of staffing for workforce planning. This review included 12 papers that provided workforce ratios of AHPs to the number of patients or beds. The included studies had varied research methodologies and study quality. Six papers used consensus to derive the ratios, though with considerable variability. One experimental trial derived a recommended AHP ratio based on outcomes from increased level of interventions. Current clinical dietitians and psychologists collected surveys, which reported insufficient staffing ratio and high levels of stress incurred by heavy caseload. Only one paper was found to report the link between staffing ratio and clinical outcomes, which suggested a statistically insignificant effect of increased staff levels on reducing length of stay and hospital bed usage. Due to limited findings, there is insufficient evidence for the use of staffing ratios in the realm of medicine and nursing. However, such information can be very useful for healthcare service planning and delivery.	2008	6/9	1/12	0/12
	Evaluation of human resources information systems	Recently, there has been an increasing awareness towards the strengthening of health systems and human resources for health (HRH) to improve population health outcomes. Human resources information systems (HRIS) act as a tool for collecting and disseminating information pertaining to the heath workforce in different countries, which contributes to the development of systems strengthening frameworks and HRH performance assessments. This	2010	3/9	1/95	0/95

		review aims to systematically examine current literature on HRIS implementation across the globe, and identify areas of improvements for policymaking purposes. The review included 95 articles that contained HRIS information, with 84% of them being grey literature. A total of 63 countries were documented, including 32 crisis countries and 31 non-crisis countries. For crisis and non-crisis countries, data on workforce supply data collection processes (63% and 75%, respectively) and on work deployment (63% and 87%, respectively) were frequently documented. Only 23% reported collected data on workforce attrition, and 44% of HRH crisis countries reported data on health worker qualifications. In addition, only a few countries reported data on health worker demographics. For data management, only 14% of HRIS documented linkages between deployment data and HRH supply, and 11% documented linkage between payroll and other kinds of HRH data. 16% of crisis countries and 32% of non-crisis countries reported the use of HRIS data for identification of licensed practitioners. The majority of HRIS reports did not explicitly state the influence of HRH data on planning and policymaking. Systems in Canada, the United States, Brazil, Kenya, Malawi, and Swaziland had key features of an effective HRIS. However, there was limited documentation of HRIS overall, which indicates the need for further research to better inform the global status of HRIS performance.				
Incorporate the full range of budgetary factors that may influence health workforce planning	No systematic reviews were identified	n/a	n/a	n/a	n/a	n/a

Appendix 3: Systematic reviews relevant to Element 3 – Select the appropriate levers to meet health workforce planning goals

Sub-element		Focus of systematic review or economic evaluation	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups
Select the appropriate levers to meet health workforce planning goals	Changes to the capacity and mix of practising health workers in the system	Evaluation of rural healthcare access and policy in developing countries (60)	Rural and remote areas have been associated with poorer health outcomes and lower life expectancy in comparison to urban regions, due to deficit of health workers and access to resources. This article aims to develop recommendations for achieving better health equity in rural areas by focusing on models of rural healthcare service, access to primary healthcare, education and training of health workers, as well as the workforce supply. Comprehensive primary healthcare involves community engagement, and many local factors such as infrastructure capacity influence patterns of health services utilization. It was found that negative perceptions of health services were associated with insensitivity and lack of trust in healthcare facilities. In order to build sustainable rural healthcare services, an integrated and multifaceted approach that involves investment in rural schools health, training programs, and relevant research is needed to strengthen health practice. A major hindrance in rural areas is an insufficient supply of health workforce to meet population needs. Students lack exposure to, support for, and background in rural training and professional development. Current undergraduate health professions are unprepared to deal with rural practice and lack the necessary skills training, as they lack engagement with rural communities. There is a need to enhance access and develop infrastructures for rural education and practice. The development of a skilled and sustainable health workforce in rural areas is critical for enhancing health, the current status of health systems, and population health outcomes. Findings suggest that policymakers should consider the health priorities specific to each community and increase recruitment and training capacity for delivering healthcare services in rural and underserviced regions.	2014	4/9	Not reported	Not reported
		Identification of contextual factors influencing the performance of community health workers (64)	Community health workers (CHWs), a vital component of the health workforce, are involved in health services delivery and often serve as the first point of contact in low- and middle-income countries. This review aims to identify the socio-cultural, economic, and political factors influencing CHW performance in achieving public health goals. This review included 94 studies, of which 42 were qualitative, 24 were	2013	4/9 (AMSTAR rating from McMaster Health Forum's Impact Lab)	0/94	Not reported

			quantitative, and 28 used mixed methods. Factors that influence CHW performance were related to community, economic context, environment, and health system policy. Lower levels of education and health knowledge in the general population were found to be associated with negative perceptions and attitudes from the CHWs. While hopes of financial or material compensation motivated individuals to become CHWs, poverty prevented people from utilizing health services. In countries such as Thailand and Bolivia, the lack of health policy and recognition by authorities led to insufficient support, training and supply of CHWs. The development of policies related to remuneration and incentives could serve to increase the workforce. Studies demonstrated that provision of regulatory frameworks, logistics support, supplies, trust and support from professional staff could motivate CHW performance. The application of effective health education strategies and interventions by CHWs should be reinforced in order to increase patient compliance and help-seeking behaviour.				
		Identification of intervention design factors influencing the performance of community health workers(74)	This review aims to identify intervention design-related factors influencing the performance of community health workers (CHWs) working in promotional, preventive or curative primary health services in low- and middle-income countries. This review included 140 studies, of which 45 were qualitative, 50 were quantitative, and 45 used mixed methods. The intervention-design factors such as service delivery, human resource management, quality assurance, engagement with community and health system influenced CHW performance. Education level of CHWs was found to influence their performance. In Kenya, higher levels of education and more years of experience were associated with appropriate use of job aids and counselling, although those with lower levels of education still managed to adopt evidence-based practice. Workers with more experience demonstrated better compassion and patient support. Both financial and non-financial incentives, such as fixed salaries, performance-based financial incentives, income from selling commodities, access to training, and respect and trust from the community were found to be effective for enhancing performance. Certification after skills assessments and continuous training increased CHW knowledge and motivation. Pre-service training was found to increase confidence and skills of CHWs when delivering services. Such training was sometimes regarded as a venue to generate more income due to higher qualifications. Overall, intervention designs that included frequent supervision, incentives,	2013	5/10 (AMSTAR rating from McMaster Health Forum's Impact Lab)	0/140	Not reported

			community involvement, continuous training and education lead to enhanced performance. These design-related factors should be taken into consideration when developing community-based health service programs.				
		Effects of pre-licensure education on health worker supply (72)	There is currently a shortage of health workers in many low- and middle-income countries (LMICs). This review aims to evaluate the effect of changes in the pre-licensure education of health workers in order to inform effective strategies for expanding workforce supply. It is important to increase the number of students entering health professional training and reduce the number of dropouts before graduation as professional trainings involve high financial and resource investments. This review included two controlled before and after studies, which are both of low quality with moderate to high risks of bias. Both studies investigated the effects of interventions to improve retention of minority individuals in training institutions. The interventions consisted of social, academic, and career support for students. Evidence demonstrated that Minority Academic Advising Programs (MAAP) could potentially increase the number of enrolled and graduated students, thereby decreasing the differences in retention levels within institutions between non-minority and minority students. Due to limited evidence for pre-licensure education in LMICs, definite conclusions could not be drawn. However, methods such as offering financial support to students, were shown to be effective in increasing health worker supply in high-income countries.	2007	10/10 (AMSTAR rating from McMaster Health Forum)	0/2	0/2
		Assessment of the public health workforce (75)	This review examines the available literature on public health workforce that focuses on four domains: 1) diversity; 2) recruitment, retention, separation, and retirement; 3) education, training, and credentialing; and 4) payment, promotion, performance, and job satisfaction. A total of 98 studies were included in the review, of which seven, 34, 51, and 10 articles addressed the aforementioned domains, respectively. Currently, there exists a significant shortage of public health workforce, especially in areas of environmental health, nursing, epidemiology, laboratory science, diet and nutrition, and social work. In order to fill the gap, more than 250,000 additional workers need to be recruited. Suggested worker retention strategies included career development, financial incentives, mentoring programs, and loan programs. The recruitment and retention of workers were also influenced by a high retirement rate and the recent economic recession. In order to attain more well-trained health workers, some public health programs have expanded to include more undergraduate degrees and introductory courses. Learning programs for public health workers need to be developed to encompass new skills and competencies. Academic institutions have been shown to play an important role in delivering such training for health workers, and also increased the diversity among the	2010	6/9 (AMSTAR rating from McMaster Health Forum)	0/98	0/98

			workforce. Numerous educational and training programs such as those in epidemiology and community outreach have been implemented at the federal level to increase the number of potential public health workers. Schools' capacity to offer certification programs and short courses should be expanded to meet the needs of health workers, which would help to further diversify their skills and knowledge and encourage participation through reduced time commitment. However, challenges such as the lack of human resource staff, clearly defined objectives and goals, as well as time and budget constraints, continue to persist. Findings suggest that the public health workface is in need of a culturally diverse workforce to address the needs of a diverse nation, recruitment and retaining of well-trained workers, development of infrastructure to support education and training, and attractive financial and non-financial incentives such as good salaries, desirable work cultures, and opportunities for career promotion.				
	Changes in the information provided to students and practising health workers that may influence where, what and how they practise	Examination of recruitment and retention challenges for home support workers (68)	Home support workers (HSWs), the largest occupational group in home care, provide services such as personal care, meal preparation and housework. There has been an increasing demand for HSWs in Canada as home care services play a crucial role in preventing health decline among the elderly. This review aims to examine the recruitment and retention of HSWs, and how to attract HSWs to meet this increasing service demand. Research found that compensation, education and training, quality assurance and working conditions are of primary focus for enhancing HSW recruitment and retention. While many jurisdictions now require HSWs to complete formal training, the lack of national standards and the high cost of programs make it difficult for HSWs to adequately meet the diverse demands of the population, and could deter potential recruitment. For instance, the increasing acuity of health conditions and advanced in-home technology demand certain skill requirements, and without consistent training, many HSWs may not possess the most up-to-date skills. The lack of a national or government regulatory body for HSWs also raises concerns about the quality and continuity of services delivered. Recruitment and retention of HSWs can be challenging in remote and rural areas. In some places, workers are expected to take on-call or split shifts, which could be limiting to their income and disruptive to their lifestyle. Alberta, Ontario, Saskatchewan, British Columbia and Newfoundland and Labrador reported a lack of human resources. Improving the amenities and breaking down social isolation could potentially increase HSW recruitment. A Quebec study indicated that HSWs prefer jobs in the public system to private agencies, where they could potentially obtain higher wages, unionization and job security.	2009	2/9 (AMSTAR rating from McMaster Health Forum)	Not reported	Not reported
		Examination of recruitment and	Many underserved areas have reported an inequitable distribution of health workers due to difficulty in training, recruiting and retaining health workers,	2007	2/9 (AMSTAR	0/55	13/55

		retention of staff in rural areas in low-and middle-income countries (66)	which can be aggravated by poor working conditions, low wages, lack of infrastructure, and high prevalence of HIV and AIDS, especially in low-income countries. This review aims to identify the factors influencing attraction and retention of health workers in remote areas of low- and middle-income countries, and to develop strategies that will improve attraction and retention. The recruitment and attraction to remote areas depend on the complex, interrelated factors influencing workers' decisions, and the government's response to such factors. Individual factors, such as marital status and geographic origin, could influence decision, as single workers had a higher turnover rate, and those with rural upbringing were more likely to return for practice. Local environment factors, such as lack of housing, healthcare, and educational intuitions for children deter workers from joining remote areas. Prospect of job security, good income, and appreciation and support from community can increase attraction to remote areas. Responding to staff shortages in remote areas, the article reported several strategies for policymakers to consider: recruitment and training for rural practice, use of incentives and compulsory services, and improving working and living conditions. Findings suggest that, due to the complex interaction of different factors, there is no single solution for improving attraction and retention. Numerous interventions, with multi-sectoral collaboration, need to be implemented to address the living and working conditions of health workers.		rating from McMaster Health Forum)		
		Describing the characteristics and methodological quality of interventions designed to improve cultural competency in health care for indigenous people (70)	Evaluations of interventions to improve cultural competency in health care for indigenous peoples were identified and assessed. All of the evaluations identified were from Australia (5) or the USA (11), and focused on interventions that included education and training the health workforce, implementing culturally specific health programs and recruiting an indigenous workforce. Overall, study designs were weak and it was difficult to draw conclusions about whether and how these interventions improved cultural competency, although some of the positive outcomes reported were improvements in health professionals' confidence, patients' satisfaction with and access to services.	2013	8/10 (AMSTAR rating from McMaster Health Forum)	0/16	16/16
	Changes in how organizations are funded, and individual health workers are remunerated to influence where, what and	Examination of recruitment and retention of staff in rural areas in low- and middle-income countries (66)	This review aims to identify the factors influencing attraction and retention of health workers in remote areas of low- and middle-income countries, and to develop strategies that will improve attraction and retention. High rates of remuneration have generally been regarded as a pull factor that attracts staff to workplaces. Different results from literature have been reported with respect to the influence of pay conditions on choice of workplace. A nurse study in	2007	2/9 (AMSTAR rating from McMaster Health Forum)	0/55	13/55

	how they practise		Thailand found an association between increasing salary and decreasing intention to leave work. In a WHO study of six African countries, remuneration was only reported by 24% of participants as a reason for leaving work. Another international study reported an indifferent attitude among health workers toward wage differences in influencing their decision of relocating to another place of practice. When examining income as an attraction factor, researchers should also consider the availability of secondary employment, such as under-the-table payment or having a private practice, in addition to the individual's primary employment.				
		Effects of financial incentives on movement of health workers between public and private organizations (77)	Many countries have reported a shortage or an uneven distribution of health workers, especially in remote and rural areas. In urban areas, health workers usually prefer to work in the private sector, which is often too expensive for people to afford. Throughout their careers, health workers can move between public and private organizations, which are both essential for effective delivery of healthcare services. This review aims to investigate the influence of financial interventions and movement restrictions on the movement of health workers between public and private organizations in low- and middle-income countries. Financial incentives, such as higher salaries, bursaries, better retirement packages, or special allowances could potentially attract more workers to certain regions. The review was unable to locate any studies that met the inclusion criteria. More research is needed to evaluate the effects of financial incentives on the movement of health workers from one sector to another.	2012	5/6 (AMSTAR rating from McMaster Health Forum)	0/0	0/0
		Examination of recruitment and retention challenges for home support workers (68)	There has been an increasing demand for home support workers (HSWs) in Canada as home care services play a crucial role in preventing health decline among the elderly. This review aims to examine the recruitment and retention of HSWs, and how to attract HSWs to meet this increasing service demand. Research reported compensation as one of the key factors affecting HSW recruitment and retention. Low wages, lack of wage parity, and limited benefits act as disincentives for people to enter the profession. Whether workers receive paid breaks, paid meeting and preparation times, and paid travel time and mileage costs are also factors that influence worker decisions. HSW wages were found to vary across regions. Factors such as higher rates of unionization and other privileges among workers inside hospitals compared to home-care settings contribute toward this discrepancy. Many HSWs have no guarantee of regular hours of employment, which makes it difficult for them to have job security and earn sufficient income to support family. Unionization may help HSWs to get more benefits and increase retention, but may also incur service cuts.	2009	2/9 (AMSTAR rating from McMaster Health Forum)	Not reported	Not reported

		Evaluation of human resource management interventions in improving health worker's performance in low- and middle-income countries (67)	This review aims to investigate which human resource management (HRM) interventions in low- and middle-income countries (LMICs) are effective in improving health workers' performance, and under which circumstances. This is a realist review, as it explores the reason why certain interventions are successful under certain circumstances and not others. This review included 48 articles, of which four were quasi-experimental studies exploring interventions targeted at payment incentives. Three interventions involved user fees and paid staff from patients' fees, or community cost-sharing schemes. Results suggest that payment incentives are effective at enhancing job satisfaction, worker performance and motivation. Contextual factors played a role in the outcome of interventions. For instance, user fees did not affect service usage by patients when they were used to paying informal fees, but decreased service utilization in other areas. While increased salaries could motivate workers to improve work quality, they could also lead to over-prescription of drugs or services in order to generate additional revenue. While the interventions reported positive outcomes, several factors, such as extra funding, staff training on financial management, results-oriented assessments related to payments, and community support for financial management, need to be taken into consideration when implementing changes.	2007	4/9 (AMSTAR rating from McMaster Health Forum)	0/48	0/48
	Changes in the examination, licensure, certification and regulation process to make it easier/harder for certain health workers to practise	Evaluation of governance mechanisms and health workforce outcomes (71)	Among the 113 included studies, six distinct governance mechanisms emerged: shared governance, Magnet accreditation, professional development and education, quality-focused initiatives, reorganization of healthcare delivery, and funding schemes. For shared governance, eight mixed-quality empirical studies reported positive effects on empowerment, increased job satisfaction, improved interprofessional relationships, and decreased turnover. There were no results to suggest Magnet accreditation is superior for improving nurse outcomes. The mixed-quality evidence suggested that Magnet accreditation may improve staff morale, job satisfaction and reduced staff turnover. Seven low-quality empirical studies discussed professional development and education programs. Overall, the review reported that there was increased confidence in collaborative practice, helped workers apply new skills and knowledge in the workplace, and improved collaborative practice. There were some mixed results on the effectiveness of continuing education. Fifteen empirical studies examined quality-focused initiatives such as clinical governance, evidence-based practice, or quality improvement initiatives. Providers were generally supportive of quality initiatives; however, there was	2012	7/9 (AMSTAR rating from McMaster Health Forum)	9/113	0/113

			often some apprehension among providers (i.e. fear of loss of autonomy, power and status). Five of the 15 studies examined the effects of training on attitudes towards or understanding of quality initiatives, and found that training increased acceptance and understanding of quality initiatives, as well as enhanced leadership skills and better team relationships. Ten studies examined various aspects of reorganization of healthcare delivery. The studies suggested that changing to team-based care is accompanied by stress and concerns about role clarity, especially among physicians. The authors noted that workforce outcomes are not explicitly considered in governance mechanism planning efforts. Additionally, other factors are needed to improve patient outcomes, such as building trust by clearly articulating the organization's goal, considering the workforce through planning, implementation and evaluation phases, and strong leadership. There is mixed evidence about how well the various governance mechanisms work to create workforce change. It is difficult to draw firm conclusions relating to health system governance and health workforce outcomes.				
		Effects of pre-licensure education on health worker supply (72)	Two low- to very low-quality studies were included to assess the effect of changes in the pre-licensure education of health workers on health-worker supply. However, these studies did not provide statistically significant effects of change in terms of interventions such as affirmative action promoting enrolment, or in buddy system or counselling. No studies were identified that showed how the loss of students could be reduced through interventions such as change in selection criteria, change in curriculum content, financial incentives, and guaranteed jobs after graduation. Overall, there is insufficient evidence to estimate the effects of interventions in pre-licensure education to increase health worker supply.	2007	10/10 (AMSTAR rating from McMaster Health Forum)	0/2	0/2
	Changes to planning approaches and policies that affect spatial location	Evaluation of implementation of health workforce policies through governance (73)	The review reported that more evidence is needed to assist in the improvement of implementation of health workforce policies through governance. There is very little information about how the workforce supply is distributed in the health system, and how interventions may affect where health workers practise. Five articles reported on reforms and decentralization, one of which found that decentralization increased flexibility in planning of local services, and may have contributed to increased retention of health workers. Some studies reported that improved equity and/or equality in the interventions were often not enough to result in the desired health workforce scenario.	2010	1/9 (AMSTAR rating from McMaster Health Forum)	0/16	0/16
		Effectiveness of interventions for attraction and retention of health workers (69)	The review assessed the effectiveness of interventions to attract and retain health workers in remote and rural areas. Measures of effects included: attractiveness of rural or remote areas, deployment, retention, and health workforce and health systems performance. Twelves studies reported on interventions that have attracted students	2009	6/10 (AMSTAR rating from McMaster Health	2/27	0/27

			towards working in rural and remote areas. The studies indicate that health workers from a rural background and who had appropriate educational preparation for rural service are more likely to practise in rural areas. Other interventions that influence retention of rural health workers include financial incentives. Seven studies reported on the effects of interventions on graduate recruitment. Multifaceted educational programs and bonding schemes have led to an increase in rural recruitment. Ten studies reported on the effects of rural retention on the performance of health workers. Two of the 10 studies indicated that there was an improvement in competencies and job satisfaction, and improved quality of care. The review reported that the intervention has to respond to the factors that health workers value in choosing to work in these areas. Additional research is needed to provide a clear conclusion.		Forum)		
		Examination of recruitment and retention of staff in rural areas in low- and middle-income countries (66)	The review reported that general living environment and social obligations are important elements in decisions on where to work. In the international environment, pull factors include higher salaries, better working conditions, and better career opportunities. At the national level, social stability, war, crime and general labour relations are factors in the retention of health workers. Local and work environment factors include management style, lack of leadership, opportunities for continuing education, equipment and support. The review identifies four strategies to improve the attraction and retention in remote rural areas: recruitment and training for rural practice; the use of incentives and compulsory services; improving working conditions; and improving living conditions. There is evidence to suggest that strategies are currently not comprehensive as they are often limited to a single or limited number of factors. Overall, there is limited literature on strategies for attraction and retention of health workers in remote rural areas in middle- and low-income countries.	2007	2/9 (AMSTAR rating from McMaster Health Forum)	0/55	13/55

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