

HEALTHCARE

POLICY

Politiques de Santé

*Health Services, Management and Policy Research
Services de santé, gestion et recherche de politique*

Volume 13 + Number 1

The Pharmaceutical Industry and the Canadian Government:

Folie à Deux

JOEL LEXCHIN

**Marijuana Use and Perceptions of Risk and Harm: A Survey among
Canadians in 2016**

ELDON SPACKMAN ET AL.

**Is Canadian Healthcare Affordable? A Comparative Analysis
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**Ranked Performance of Canada's Health System on the International
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Healthcare Policy/Politiques de Santé seeks to bridge the worlds of research and decision-making by presenting research, analysis and information that speak to both audiences. Accordingly, our manuscript review and editorial processes include researchers and decision-makers.

We publish original scholarly and research papers that support health policy development and decision-making in spheres ranging from governance, organization and service delivery to financing, funding and resource allocation. The journal welcomes submissions from researchers across a broad spectrum of disciplines in health sciences, social sciences, management and the humanities and from interdisciplinary research teams. We encourage submissions from decision-makers or researcher–decision-maker collaborations that address knowledge application and exchange.

While *Healthcare Policy/Politiques de Santé* encourages submissions that are theoretically grounded and methodologically innovative, we emphasize applied research rather than theoretical work and methods development. The journal maintains a distinctly Canadian flavour by focusing on Canadian health services and policy issues. We also publish research and analysis involving international comparisons or set in other jurisdictions that are relevant to the Canadian context.

Politiques de Santé/Healthcare Policy cherche à rapprocher le monde de la recherche et celui des décideurs en présentant des travaux de recherche, des analyses et des renseignements qui s'adressent aux deux auditoires. Ainsi donc, nos processus rédactionnel et d'examen des manuscrits font intervenir à la fois des chercheurs et des décideurs.


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Bien que *Politiques de Santé/Healthcare Policy* encourage l'envoi d'articles ayant un solide fondement théorique et innovateurs sur le plan méthodologique, nous privilégions la recherche appliquée plutôt que les travaux théoriques et l'élaboration de méthodes. La revue veut maintenir une saveur distinctement canadienne en mettant l'accent sur les questions liées aux services et aux politiques de santé au Canada. Nous publions aussi des travaux de recherche et des analyses présentant des comparaisons internationales qui sont pertinentes pour le contexte canadien.

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Health and Healthcare in Canada 150 Years After Confederation and Beyond

MILESTONE ANNIVERSARIES TRIGGER REFLECTION. CANADA'S 150TH ANNIVERSARY of Confederation is no exception. Conversations about whether this is an event to celebrate, where we have come from, and where we want to go weave through this year's festivities.

In this context, it seems an appropriate time to reflect on health and healthcare, past and present.

Healthcare in what is now Canada long predates Confederation. Traditional healing draws on a rich heritage, with teachings developed and passed down over centuries. The first formal hospitals were established in New France in the 17th century. Public health, understanding of anatomy and disease, clinical care and education and regulation have evolved considerably since then.

While overall life expectancy has risen significantly since Confederation, it remains true that not all people have equal life chances. Gaps in health fluctuate over time, but inequities have existed for at least as long as statistics have been tracked. For example, there are at least 10-year differences in life expectancy across provinces and territories, as well as between regions within several jurisdictions.

A recent report from the Commonwealth Fund offers further examples of the equity challenges that we face (Schneider et al. 2017). The Fund ranked healthcare in Canada 9th out of 11 countries. As in so many cases, these results are best understood by unpacking the overall score. While Canada had the best results for preventive care indicators, we had the worst score for timeliness of care. We also lost marks for equity – or rather inequity – of results. For instance, 7% of those with above average incomes said that they had cost-related access problems for medical care (e.g., medications) in the past year. That compares with 24% of those with below average incomes. This gap was wider than in most other countries included in the survey.

These results offer food for thought about the health system – and the society – that we would like to nurture over the next 150 years, as do the articles in this issue of *Healthcare Policy/Politiques de Santé*. Lesley Soril and colleagues use Commonwealth Fund data to delve more deeply into questions about the affordability of care, while Said Najafizada and co-authors explore how the performance of our health system compares with that of other countries based on rankings from a variety of sources. Other authors address topical policy issues, such as perception of risk and harm of marijuana use, the dynamic tension between

From the Editor-in-Chief

the pharmaceutical industry and government, planning for pandemic influenza, and what influences team-based primary care.

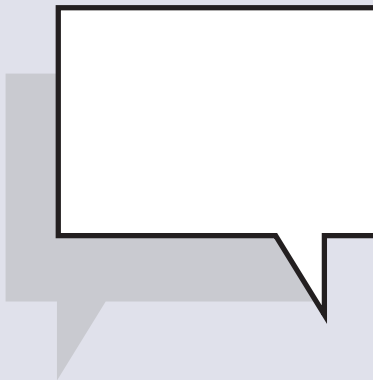
Each of these issues is high on the policy agenda for 2017 and decisions made will influence health and health services for many years to come. As you engage in dialogue and debate around these questions, I hope that you will take advantage of the new information and insights that authors share in this issue of the journal.

JENNIFER ZELMER, PHD

Editor-in-Chief

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Schneider, E.C., D.O. Sarnak, D. Squires, A. Shah and M.M. Doty. 2017. *Mirror, Mirror 2017: International Comparison Reflects Flaws and Opportunities for Better U.S. Health Care*. New York, NY: The Commonwealth Fund. Retrieved July 25, 2017. <<http://www.commonwealthfund.org/publications/fund-reports/2017/jul/mirror-mirror-international-comparisons-2017>>.



Let's talk.

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Santé et soins au Canada 150 ans après la Confédération

LES ANNIVERSAIRES PORTENT À LA RÉFLEXION. LE 150^e ANNIVERSAIRE DE LA Confédération canadienne ne fait pas exception. Cette année de festivités est marquée par des discussions sur l'importance ou non de célébrer, sur notre provenance et sur nos aspirations futures.

Dans ce contexte, il semble approprié de réfléchir sur la santé et les soins de santé du passé et du présent.

Les soins de santé dans ce qui est maintenant le Canada étaient présents bien avant la Confédération. Les traditions de la guérison puisent à même un riche héritage dont l'enseignement se transmet depuis des siècles. Les premiers hôpitaux officiels ont été établis en Nouvelle-France au XVII^e siècle. Depuis lors, la santé publique, la connaissance de l'anatomie et des maladies, les soins cliniques, la formation et la réglementation ont tous considérablement évolué.

Alors que l'espérance de vie est en hausse depuis la création de la Confédération, il est encore vrai que tous les peuples n'ont pas des chances égales. Les écarts en santé fluctuent au cours du temps, mais les inégalités existent depuis aussi longtemps que l'on tient des statistiques sur le sujet. Par exemple, il y a au moins 10 ans d'écart dans l'espérance de vie entre certaines provinces et territoires, de même qu'entre les régions de plusieurs autorités gouvernementales.

Un rapport récemment publié par le Fonds du Commonwealth présente d'autres exemples de défis en matière d'équité (Schneider et al. 2017). Le Fonds classe le Canada 9^e parmi 11 pays. Et comme dans plusieurs cas, ces résultats prennent leur sens en analysant dans le détail les résultats généraux. Bien que le Canada obtienne les meilleurs résultats pour les indicateurs de soins préventifs, il présente les pires scores pour la rapidité des soins. Le pays a aussi perdu des points pour ce qui est de l'équité – ou plutôt l'iniquité – des résultats. Par exemple, 7 % des personnes qui ont un revenu au-dessus de la moyenne indiquent avoir éprouvé des problèmes d'accès aux soins médicaux liés aux coûts (p. ex., les médicaments) au cours de l'année écoulée; contre 24 % de celles qui ont un revenu au-dessous de la moyenne. Cet écart était plus marqué que dans la plupart des autres pays ayant fait l'objet de l'enquête.

Ces résultats portent à réfléchir au sujet du système de santé – et de la société – que nous voulons mettre en place pour les 150 prochaines années; comme c'est le cas des articles de ce numéro de *Politiques de Santé/Healthcare Policy*. Lesley Soril et ses collègues examinent les données du Fonds du Commonwealth pour approfondir la question de l'abordabilité des soins. Said Najafizada et ses co-auteurs explorent le rendement de notre système de santé

De la rédactrice en chef

comparé à celui d'autres pays selon les classifications provenant de diverses sources. Ailleurs, les autres auteurs s'intéressent à des enjeux politiques tels que la perception des risques et dommages de l'usage de la marijuana, la dynamique des tensions entre l'industrie pharmaceutique et le gouvernement, la planification face à une pandémie d'influenza et les facteurs d'influence pour les équipes de soins de santé primaires.

Chacun de ces sujets figure en première place du programme politique de 2017 et les décisions qui seront prises en ce sens influenceront la santé et les services de santé pour les années à venir. J'espère que vous tirerez profit des renseignements et nouvelles pistes que les auteurs présentent dans le présent numéro, afin de vous engager pleinement dans les débats sur ces questions.

JENNIFER ZELMER, PHD

Rédactrice en chef

Référence

Schneider, E.C., D.O. Sarnak, D. Squires, A. Shah et M.M. Doty. 2017. *Mirror, Mirror 2017: International Comparison Reflects Flaws and Opportunities for Better U.S. Health Care*. New York, NY: The Commonwealth Fund. Consulté le 25 juillet 2017. <<http://www.commonwealthfund.org/publications/fund-reports/2017/jul/mirror-mirror-international-comparisons-2017>>.



The Pharmaceutical Industry and the Canadian Government: *Folie à Deux*

L'industrie pharmaceutique et le gouvernement canadien : folie à deux



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Abstract

The interest of the pharmaceutical industry is in achieving a profit for its shareholders while the interest of the Canadian government should be in protecting public health. However, over the course of the past few decades the actions of the Canadian government have been tilted in favour of industry in two areas. The first is in the relationship between industry and Health Canada and is manifested in the regulation of clinical trials, the drug approval system, drug safety and promotion. The second is in economic policy as it applies to policies about patent protection, the price of medications and measures taken to incentivize research and development. The problems in the relationship are structural and will only be solved through systemic changes.

Résumé

L'intérêt de l'industrie pharmaceutique est d'obtenir du profit pour ses actionnaires, tandis que l'intérêt pour le gouvernement canadien devrait être de protéger le public. Toutefois, au cours des dernières décennies, les actions du gouvernement canadien ont penché en faveur de l'industrie dans deux domaines. Le premier a trait à la relation entre l'industrie et Santé

Canada et se manifeste dans la réglementation des essais cliniques, le système d'approbation, la sécurité et la promotion des médicaments. Le deuxième touche à la politique économique dans le secteur de la protection conférée par les brevets, aux prix des médicaments et aux mesures prises pour encourager la recherche et le développement. Les problèmes de la relation sont d'ordre structurel et ne se résoudront que par des changements systémiques.

Introduction

As a doctor working in an emergency department, I write prescriptions every time I work, and I believe that these prescriptions help my patients. I have great respect for the value of medications when they are affordable and used properly. However, at the same time, I believe that government and industry have come to share far too many of the same goals in two areas – the drug regulatory system and industrial policy as it relates to intellectual property rights (IPRs), research incentives, drug prices and views about innovation. These are issues that I will explore primarily in the Canadian context, although occasionally drawing on American data. While the details in this article are Canadian, the issues faced are common to pharmaceutical policy in most of the developed world.

Profits versus Public Health

A number of systemic problems have led to our current situation. I start from the position that we should not be under any illusion about why pharmaceutical companies exist. Like any other corporations, they have an obligation to make profits for shareholders and investors. They should, therefore, do whatever is legal to advance this objective. However, the companies' economic aims often seem to conflict with their declared goal of improving health. As Davis and Abraham point out (Davis and Abraham 2013), society has a dual expectation from the pharmaceutical industry. On the one hand, companies should make profits for shareholders and investors, while on the other, the products that they produce should also provide a health benefit. From the viewpoint of the industry, that is exactly what it has been doing, and its economic success is a mirror of the success that it has had in creating products and innovations needed by patients. Governments also recognize the dual nature of the industry and "have not been so naive as to accept that the pharmaceutical industry's commercial motives will always deliver new drug products in the best interests of patients" (Davis and Abraham 2013). As a result, government drug regulatory agencies exercise a check on drug companies' claims both before and after products are marketed. However, governments face conflicting objectives. On the one hand, they recognize the need to regulate the industry in the interests of public health, but on the other hand they also rely on the industry to help fuel their economies. The question that I want to pose is, whose interests are being served in the way that the state is regulating the industry?

Neo-liberalism and Deregulation

My answer is that, with a few exceptions, most western states have sought cooperation with the pharmaceutical industry. The alliance of interests between the state and the industry has not been static but has markedly increased over the past two decades as the neo-liberal agenda gained momentum in the mid-1980s, accelerating the deregulatory trend and further deepening the relationship between the two. Neo-liberalism is focused on the power of the marketplace and supports a diminished role for the state in protecting its citizens by letting industry set its own regulatory standards and police them. This acceleration in the deference to industry is best understood in the context of corporate bias. The state did not completely surrender its regulatory role, but attempts to exert more authority were undertaken in a half-hearted manner that avoided confrontation with industry and actually strengthened the position of industry. As one example, we only need to look at the regulation of post-marketing studies in Canada. Post-marketing studies are of particular importance with respect to drug safety, given that even relatively large efficacy trials have insufficient power to detect rare but serious adverse events. Despite these limitations, fulfillment of the requirement to undertake these studies and complete them in a timely manner is poorly enforced in both Canada and the US (Fain et al. 2013; Law 2014) leading to a situation whereby the true benefits and harms of drugs remain unknown for years.

Often, government has gone beyond cooperation and actively promoted industry's interests through legislation and policies, even when industry's interests conflicted with those of the public, as is the case with the adoption of user fees whereby the pharmaceutical industry funds some or all of the operating costs of the regulatory authority. As the head of the drugs program branch of Health Canada put it in an internal 1997 bulletin that discussed user fees: "the client is the direct recipient of your services. In many cases this is the person or company who pays for the service." The one-page document focused on service to industry and relegated the public to the secondary status of "stakeholder" or "beneficiary" (Michols 1997). Regulatory authorities took on the obligation of meeting the needs of their clients, especially when it came to how quickly drugs went through the regulatory review process. Each day of delay in getting a drug onto the market could mean the loss of millions of dollars in sales. With speedier drug reviews now a priority, regulatory authorities devised new pathways to get drugs through the system at a faster rate (Darrow et al. 2014) with lower standards of evidence (Kesselheim et al. 2015) and a higher level of safety problems once drugs appear on the market (Carpenter et al. 2008; Lexchin 2012b, 2014; Olson 2002).

In other areas such as promotion most governments have voluntarily turned over de facto regulatory power to industry (Lexchin 2012a; Lexchin and Mintzes 2014) with the result that when doctors get their prescribing information directly from pharmaceutical companies the outcome is highly likely to be more expensive prescribing, more frequent prescribing and poorer quality of prescribing (Spurling et al. 2010).

Neo-liberalism fitted well with government's smart regulatory agenda, a move to decrease the regulatory burden on companies, and with the belief that providing the conditions for industry investment and research and development (R&D) would inevitably produce better drugs, better health, more economic activity, and more high-end jobs in the knowledge economy. This attitude was exemplified in a Canadian government document touting smart regulation as a way to put the emphasis on removing barriers and so move Health Canada to a place where it could "regulate in a way that enhances the climate for investment and trust in the markets [and] ... accelerate reforms in key areas to promote health and sustainability, to contribute to innovation and economic growth, and to reduce the administrative burden on business" (Government of Canada 2002).

The key, according to government thinking, was to make sure that companies could retain monopoly rights to the medications for long enough to generate the profits necessary to produce the next generation of "wonder" drugs. And, of course, respect for IPRs as private property was a necessary component of this equation.

Stronger Intellectual Property Rights

When it comes to economic and industrial policy, the best interests of the pharmaceutical companies do not necessarily coincide with what is best for the entire country and for public health writ large. Here again, we assume that government should balance these interests when it makes decisions about IPRs, how much drugs should cost and how best to encourage research that advances public health. Thus, in Canada, federal governments from the right (Conservative) and centre (Liberal) were willing to cooperate with industry demands for longer and more stringent patent rights and to put in place regulations to delay the entry of generic products (Lexchin 2011).

On the economic front, better IPR protection certainly benefits industry, but it is hard to demonstrate that it has helped the overall Canadian economy or the health of Canadians. However, it has generated costs in the form of legal expenses, longer monopoly periods with higher prices, vast sums spent researching and developing "me too" drugs that constitute almost 90% of products approved (Light et al. 2013), billions of dollars spent on drug promotion and restriction on the dissemination of research results to maintain a commercial advantage (Baker and Chatani 2002). Up until the mid-1980s, Canada relied on a system of compulsory licensing to import to keep drug prices in check. The decision to ratchet up IPRs and abolish compulsory licensing is one of the reasons that Canada now has the fourth highest annual per capita spending on prescription drugs in the Organisation for Economic Co-operation and Development (OECD 2015). Companies do not price products based on their R&D costs but rather on what they think that the market will bear, an interpretation endorsed by senior drug company executives (McKinnell 2005). The more desperate the patients are for the drug, the higher the price. This is painfully evident in the prices in Canada of Kalydeco (ivacaftor) for cystic fibrosis and Soliris (eculizumab) for atypical hemolytic uremic syndrome at \$300,000 and \$700,000 per year per person, respectively.

Who Benefits from Industry Research and Development?

Policy decisions about R&D have been predicated on the assumption that more R&D is better and that stronger IPRs are necessary to achieve the desired R&D spending. Industry has often encouraged that attitude with both threats of withdrawing R&D investment and promises of increasing investment, all contingent on the amount of IPR protection that is offered. But even senior pharmaceutical executives discount the importance of the strength of IPRs in making decisions about where to locate R&D. Instead, they cite a location in which they could do good science by accessing world-leading scientists as the most important factor. The only time that IPRs figured into their thinking was when it came to countries such as India and China that were perceived as having inadequate systems for protecting IPRs (Bramley-Harker et al. 2007).

Governments have also failed to recognize the difference between the industry definition of innovation as a new molecule and the patient-oriented definition as a drug that substantially improves health. New molecules can be spectacularly profitable as witnessed by Lipitor (atorvastatin) that made Pfizer \$125 billion over 14.5 years (t Hoen 2016) but that does not necessarily mean that they are better than alternatives for patients. On the latter measure, industry R&D outputs leave a lot to be desired. Between 1997 and 2012, Health Canada approved 292 new active substances (molecules never marketed before in any form) where both their therapeutic value and mechanism of action could be evaluated. Ninety-eight were first-in-class, i.e., operated through a novel mechanism, but only 16 (16.3%) of these were significant therapeutic advances. For the remaining 194, the situation was even worse with just 9 (4.6%) rated as a significant therapeutic advance (Lexchin 2016). Cancer drugs fare no better. The 71 drugs approved by the US Food and Drug Administration from 2002 to 2014 for solid tumours have resulted in median gains in progression-free and overall survival of only 2.5 and 2.1 months, respectively (Fojo et al. 2014)

How to Make Government Serve the Public Interest

The problems we are seeing are, obviously, not the result of individuals working within the drug companies or the government. In fact, many good people work in all sectors. The problems are structural and only systemic changes will help solve them. However, despite both parties – government and industry – being part of the problem, only one, government, is part of the solution. To quote Davis and Abraham, “the narrowly construed definition of regulatory efficiency as speed of regulatory review and marketing approval during the neo-liberal era has been misguided from the perspective of the interests of patients and public health, though it has served the commercial interests of industry” (Davis and Abraham 2013). Regulatory authorities’ primary purpose is the protection of public health, and as such, they should be entirely publicly funded so that there is no confusion about who their client is. In the US, this recommendation has come from a variety of high profile academics and others including three former editors of the *New England Journal of Medicine* and former senior employees of the Food and Drug Administration (Angell et al. 2007). Fetishization of IPRs

is good for the economic health of industry but not for the results of R&D or drug prices. Canada, in cooperation with other countries, should actively advocate for alternatives to the patent system for supporting pharmaceutical innovation and fund pilot projects to look at the feasibility of alternative models. These could include public funding of clinical trials (Baker 2008; Lewis et al. 2007) and paying companies a monetary reward that reflects the social value of new medications in return for the companies surrendering their monopoly patent rights (Grootendorst 2009). Governments need to put more weight on protecting public health and reducing wasteful spending on drugs with no therapeutic advantages over existing products, and less on protecting the interests of the pharmaceutical industry. Doing so will benefit both patients and the public purse.

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Marijuana Use and Perceptions of Risk and Harm: A Survey among Canadians in 2016

Usage de la marijuana et perceptions des risques et dommages : sondage auprès des Canadiens en 2016



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ON BEHALF OF THE HEALTH TECHNOLOGY ASSESSMENT UNIT

Abstract

Objectives: To describe marijuana use by Canadians and their perceptions of risk and harm.

Design: A cross-sectional, structured, online and telephone survey.

Participants: A nationally representative sample of Canadians.

Methods: This survey used random probability sampling and targeted respondents based on age, sex, region and their expected response rate.

Results: Of the 20% of respondents reporting marijuana use in the past 12 months, they were more likely to be younger and male. The most common form of use was smoking, 79%. When asked about harmfulness, 42% and 41% responded that they considered marijuana more harmful than helpful to mental health and to physical health, respectively. When asked about driving under the influence, 71% responded that it was the same as alcohol.

Conclusion: This research is important for health providers and policy makers seeking to maximize public health through clinical and legislative reform of non-medical use of marijuana.

Résumé

Objectifs : Décrire l'usage de la marijuana chez les Canadiens ainsi que leurs perceptions des risques et dommages.

Conception : Sondage transversal structuré, en ligne et téléphonique.

Participants : Échantillon national représentatif des Canadiens.

Méthodes : Ce sondage a eu recours à un échantillonnage probabiliste aléatoire et à des répondants ciblés selon l'âge, le sexe, la région et le taux de réponse escompté.

Résultats : Les 20 % de répondants qui ont indiqué avoir fait usage de la marijuana au cours des 12 derniers mois sont plus susceptibles d'être des jeunes hommes. La forme d'usage la plus courante est par l'inhalation de fumée, 79 %. Au sujet de la nocivité, 42 % et 41 % ont répondu qu'ils considéraient la marijuana plus dommageable que salutaire pour la santé mentale et la santé physique, respectivement. Au sujet de la conduite sous influence, 71 % ont répondu que c'était comme pour l'alcool.

Conclusion : Cette recherche est importante pour les fournisseurs de services de santé et les responsables de politiques qui veulent maximiser la santé publique par une réforme clinique et législative de l'usage non médical de la marijuana.

Introduction

Marijuana is currently an illicit substance in Canada. However, there have been long standing debates over policy reforms to decriminalize or legalize its use (Fischer et al. 2003, 2009; Hall 2009), and discussion on the merits of shifting from a model of criminalized prohibition to a public health approach. Currently, legal use is restricted to medical purposes, as outlined and governed by the Federal Government and as specified in *Access to Cannabis for Medical Purposes Regulations* (ACMPR).

Self-reported marijuana use is lower than alcohol or tobacco use. Nationally, 78% report using alcohol, 17% report using tobacco, 10% report using marijuana and 3% report using other substances in 2012 (Health Canada). Although the harms and health risks associated with problematic drinking and smoking tobacco have been widely studied and broadly disseminated, the health risks associated with marijuana use have received less attention (Nutt et al. 2007, 2010). Recent syntheses conclude that the health harms associated with marijuana may include increased risk of psychosis, but the causal relationship is still unclear (Large et al. 2011; Le Bec et al. 2009; Marconi et al. 2016; Minozzi et al. 2010; Moore et al. 2007; Myles et al. 2012, 2016; Semple et al. 2005; Szoke et al. 2014), mania (Gibbs et al. 2015), suicide (Borges et al. 2016; Calabria et al. 2010; Lev-Ran et al. 2014), depression (Lev-Ran et al. 2014; Rey et al. 2004), neurological soft signs (Ruiz-Veguilla et al. 2012), neurocognitive changes, some cancers (Gurney et al. 2015; Huang et al. 2015), stroke (Hackam 2015) and low birth weight complications (English et al. 1997; Gunn et al. 2016).

In 2015, the Federal Government of Canada announced plans to legalize marijuana for recreational use (medical use has been legal across Canada since 2001). In June of 2016, a nine-member Federal Task Force on marijuana legalization and regulation was announced. In November of 2016, the Federal Task Force published “A Framework for the Legalization and Regulation of Cannabis in Canada.” Guided in part by recommendations from this Task Force, legislation (Bills C-45 and C-46) was tabled in Canada’s Parliament in April 2017 and is expected to be finalized by July 2018, albeit, individual provinces must then align with and implement this Federal legislation (Canada 2016). With this national policy direction, it is likely that the public discourse surrounding marijuana and health will shift. There is a need for physicians, care providers and policy makers to understand how the Canadian public perceives the harms of marijuana (Canada 2016; CMA 2016), particularly if these perceptions contradict the best available evidence. This will better equip policy makers to develop public health messages, approaches tailored to subpopulations of users and evidence-informed, coordinated policy efforts to reduce the risks of marijuana use. In addition, in the clinical setting, the educator role of physician and other healthcare providers may become increasingly important in helping patients to understand the benefits, risks, health harms and effects of marijuana use. Accordingly, the objective of this study is to describe the attributes of users, patterns of use and perceptions of risk and health harms of marijuana among Canadians.

Methods

Survey design

The survey was designed to ask Canadians about their usage and perceptions of the harms of marijuana compared to other substances (i.e., alcohol and tobacco). Broadly, the questions were developed to understand personal use patterns and the extent to which Canadians perceive marijuana to be harmful to mental and physical health. If respondents indicated a perception of harm, this harm was compared to other common substances. Survey development was informed and refined by expert opinion and a pilot was completed with 10 respondents (McIsaac 1995) to verify the clarity of the questions and 15 respondents as an online pre-test. Participants were selected using a convenience sample and snowball technique. The survey was implemented by a private survey firm (EKOS). The sampling frame and respondent profile was designed to be representative of the Canadian population as well as British Columbia, Alberta, Ontario and Quebec, using the 2011 Canadian Census. Questions were administered in both English and French online and via telephone.

Sampling

Respondents were contacted from a panel of 90,000 members selected using random probability sampling. Participants were contacted online or by telephone (land-line or cell-line). To ensure a representative final sample, members were targeted based on age, sex, region and their expected response rates. The random probability sample avoids the self-selection bias of opt-in convenience samples. It also allows for calculation of confidence intervals and error testing. Online participants were e-mailed up to two times and telephone participants were called up to five times.

Survey questions

The survey included demographic questions as used on the Canadian Census (age category, sex, province of residence, income category and educational attainment). Marijuana use was established using the validated questions from the Canadian Alcohol and Other Drug Use Monitoring Survey (CADUMS) used by Statistics Canada. Mode of use, age of first use and patterns of use were also ascertained. Respondents were asked “What best describes the impact of recreational marijuana on physical health?” with four responses possible: (1) more harmful than helpful, (2) more helpful than harmful, (3) no impact and (4) unsure. The same question was used to assess perceived mental health harm. When respondents indicated that marijuana was harmful, they were then asked if it was more, less or similarly harmful compared to cigarettes, alcohol, prescription drugs and other illicit drugs (cocaine, crack, speed, ecstasy). Respondents were asked whether driving under the influence is (1) as harmful as driving while intoxicated because of alcohol, (2) not as harmful as driving while intoxicated because of alcohol or (3) more harmful than driving while intoxicated because of alcohol. Respondents were asked if they think marijuana is addictive and how its addictiveness compares to cigarettes, alcohol, prescription drugs and other illicit drugs. Lastly, respondents were asked whether they believe the use of marijuana leads to other illicit drug use.

Analysis

Data were weighted to match regional, sex and age proportions nationally. For categorical data, simple proportions were calculated. Multinomial regression analysis was used to understand and control for the relationship between respondents' personal characteristics and their responses. Personal characteristics used in the model were age, sex, highest level of education, income, region and reported marijuana use.

Results

Respondents

Contact was attempted with 11,272 panel members (6,437 online and 4,835 by phone). There were 2,088 completed surveys, 1,788 online and 300 by telephone, resulting in a response rate of 18.5%. Respondents ranged in age from 19 to 95 years old. Responses were weighted to be representative of the Canadian population.

Characteristics of users

Twenty per cent of Canadians reported having used marijuana in the past 12 months, with no difference in the proportions across provinces: 20% in Alberta, 20% in British Columbia, 18% in Ontario, 19% in Quebec. The proportion of respondents reporting marijuana use is higher in males and those younger than 35 years of age (Figure 1). Respondents with an income of less than \$50,000 were also more likely to report marijuana use in the last 12 months compared to other higher income categories ($p < 0.05$).

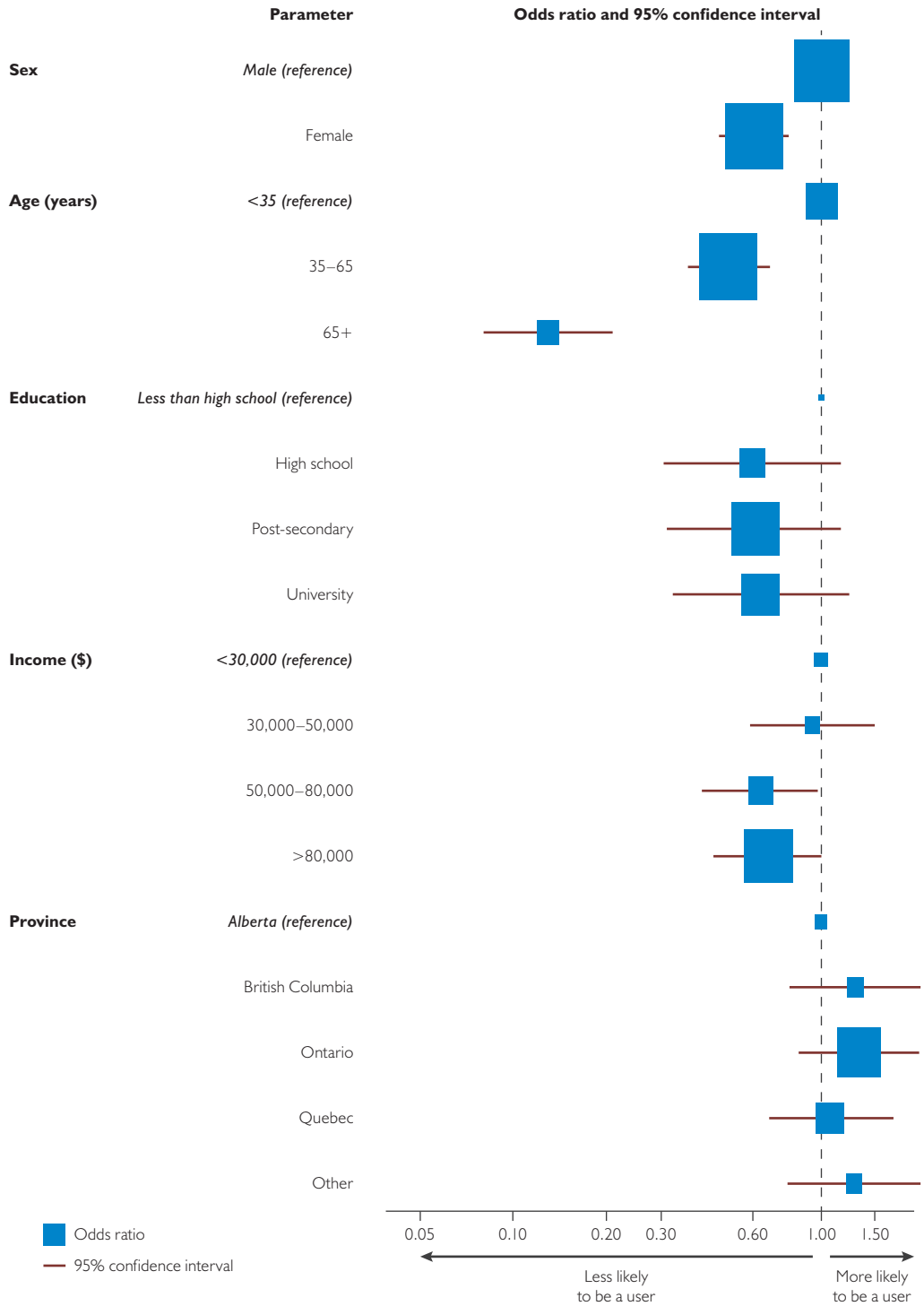
Patterns of use

Those reporting marijuana use reported a median age of first use of 17 (interquartile range = 5) ranging from 9 to 78 years old. Age of first use was less than 16 years old for 48% of respondents and 10% reported age of first use as 25 years or older (Table 1). Forty-three per cent of respondents reported that they used marijuana yearly while 17% reported daily use. The most common method of use was smoking dried marijuana, with 79% of users indicating this as their preferred method of consumption. Other methods included smoking marijuana mixed with tobacco (co-use) (24%), using a vaporizer (25%) or bong (23%); or consuming edibles (31%), oil (13%) and hashish (15%). Differences in methods of use and products used were observed by sex, age and province. Respondents from Quebec were more likely to smoke, use a vaporizer or edibles ($p < 0.04$) and less likely to roll with tobacco than respondents in the rest of Canada ($p < 0.01$). Females reported being more likely to use a vaporizer than males ($p = 0.01$) and respondents less than 35 years of age were more likely to use a bong ($p < 0.03$).

Perception of social effects

Seventy-one per cent responded that driving under the influence of marijuana is similarly harmful as driving under the influence of alcohol. However, 21% responded that they did not believe driving under the influence of marijuana was as harmful as alcohol and 4% responded they were unsure. Females and those 65 years and older were significantly more likely to say that driving under the influence of marijuana is as harmful as alcohol ($p < 0.04$).

FIGURE 1. Respondents' personal characteristics and marijuana use in the past 12 months



Note: Variables controlled for in the model: sex, age, education, income and province.

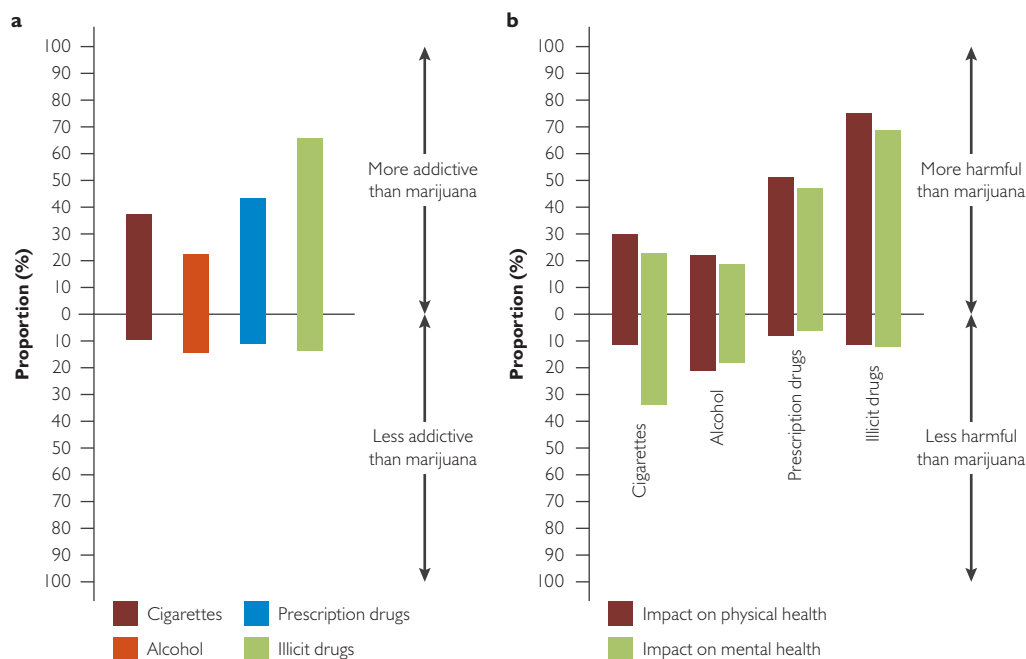
Marijuana Use and Perceptions of Risk and Harm: A Survey among Canadians in 2016

TABLE 1. Practice of marijuana users

Factors of marijuana use	%
Age of first use	
<16	48
16–18	21
19–21	15
22–24	5
≥25	10
Frequency of use	
Daily	17
Weekly	18
Monthly	19
Yearly	43

Factors of marijuana use	%
Methods of use	
Smoked	79
Rolled with a cigarette	24
Vaporizer	25
Bong	23
Edibles	31
Oil	13
Hashish	15

FIGURE 2. Canadian perceptions of the harm (a) and addictiveness (b) of marijuana



Fifty-eight per cent of Canadians perceive marijuana to be an addictive substance. Broadly, 37% of Canadians think that cigarettes are more addictive than marijuana, 23% think alcohol is more addictive, 44% that prescription drugs are more addictive and 65% think other illicit drugs are more addictive than marijuana (Figure 2a). Those not indicated in the figure responded that they believe marijuana is equally as addictive.

Fifty-five per cent of Canadians believe that consumption of marijuana does not lead to the use of other illicit drugs. Non-users and those over 65 years of age are more likely to perceive that marijuana use leads to the use of other illicit drugs ($p < 0.01$).

Perceptions of physical and mental harms

Twenty-one per cent responded they were unsure if marijuana caused physical harm. Forty-one per cent responded that marijuana is more harmful than helpful to physical health, 21% responded that it is more helpful than harmful and 14% responded that it had no impact on physical health. Of those that stated that marijuana is physically more harmful than helpful, 22% responded that alcohol is more harmful than marijuana and 75% responded that other illicit drugs are more harmful to physical health (Figure 2b). Respondents reporting that they had not used marijuana in the last 12 months were more likely to say that marijuana is more harmful than helpful to physical health compared to those who have reported marijuana use in the past 12 months ($p < 0.01$).

Twenty-three per cent responded they were unsure if marijuana caused mental health harm. Forty-two per cent responded that marijuana is more harmful than helpful to mental health, while 22% reported that marijuana is less harmful than helpful and 10% reported that it has no impact. Of those that stated that marijuana is mentally more harmful than helpful, 19% responded that alcohol is more harmful than marijuana and 69% responded that other illicit drugs are more harmful to mental health (Figure 2b). As with physical harms, non-users were more likely to respond that marijuana is more harmful than helpful than marijuana users ($p < 0.01$). Eighty-one per cent of respondents who said marijuana was harmful to physical health also replied that marijuana was harmful to mental health.

Discussion

This study reports on current marijuana usage in Canada and Canadians' perceptions of risk and harm. Twenty per cent of Canadians report marijuana use in the past 12 months. Similar rates of use are reported across provinces. Forty-eight per cent of marijuana users report their age of first use as less than 16 years of age. A similar per cent perceives that marijuana is more harmful than helpful to physical health (41%) and mental health (42%). Notably, the majority of Canadians perceive driving under the influence of marijuana to be as harmful as driving under the influence of alcohol (71%) and that marijuana is addictive (58%).

It is important for physicians and health providers to be aware that use is occurring in all populations. Although use is higher in younger men, there is use across all age groups, education levels and incomes. This finding challenges the stigma generally associated with people who use illicit substances. Awareness that marijuana use occurs across all demographics should encourage physicians and health providers to assess marijuana consumption as part of a routine visit with all of their patients.

When asked about the harmfulness of marijuana, 42% and 41% responded that they considered it more harmful than helpful to mental health and to physical health, respectively. Given the evidence that marijuana use is associated with harms, such as increased stroke, inflammation of

lungs, anxiety, psychosis, depression, mania, low birthweight complications and behavioural issues, there is a clear need to initiate public health campaigns to begin a dialogue with Canadians about the health consequences of use. There may be lessons that can be learned from tobacco and alcohol public health campaigns aimed at denormalizing smoking and reducing problematic drinking, recognizing that health education campaigns must be paired with tight regulation under the goal of reducing the harms of substance use (Kolar et al. 2015). In the context of legalization, a “single substance” approach to prevention is unlikely to be sufficient, but may require efforts to address cannabis co-use. For example, the risks to respiratory health from smoking cannabis mixed with tobacco – the chosen route of administration for many of our survey respondents – and the increased intoxication risks of combining alcohol and cannabis co-use.

Evidence suggests that marijuana use in some individuals may be associated with serious mental illness, such as psychosis, mania, suicide and major depression (Borges et al. 2016; Gibbs et al. 2015; Lev-Ran et al. 2014; Ruiz-Veguilla et al. 2012). Close to 50% of Canadians may be underestimating the mental health harms associated with frequent or heavy marijuana use. Within the current climate of public efforts around “destigmatizing” mental health, legalization may provoke a context for more open conversations between users and their healthcare providers about the possible role of marijuana in their mental health.

Approximately 50% of users reported their age of first use as less than 16 years of age. This is particularly concerning given the growing evidence that suggests the neurocognitive and developmental effects of marijuana use for those under 25 years of age. Based on the developing neuroscience, the Canadian Centre on Substance Abuse recommended avoidance below the age of 24 or 25 years and the Canadian Medical Association set the age restriction at 21 years of age. The recommendation of the Task Force is that the minimum age of purchase be 18 years old, although provinces will set their own age limits and may or may not choose to harmonize age restrictions with alcohol and tobacco. There is a push towards older age restrictions to reduce youth access, albeit tempered with the sense that youth may continue to access through a parallel illegal market. While the risk of a parallel illegal market is an important consideration in formulating regulation, it should not deter from setting policy to improve public health.

Of note, respondents in our survey were more likely than respondents in previous surveys to indicate use of marijuana in the last 12 months, 20% compared to 11% in the 2013 CADUMS, completed by Statistics Canada. These differences may be real or may be because of differences in survey methods. CADUMS conducted telephone interviews with 1,008 respondents aged 15 and older per province, that is, 10,080 interviews annually. The response rate was 39.8%. The high number of interviews and response rates is important since they used random sampling rather than probability sampling. As in this study, results were weighted to match the Canadian Census. Differences in marijuana use may be due to Canadians being more willing to self-report marijuana use on a non-governmental survey or because the survey was online. Equally, it may be due to a higher willingness to identify as a marijuana user knowing that it is likely to be legalized. Regardless of the reason, this survey indicates that the self-report use of marijuana is higher than has been previously shown.

Despite attempts to achieve representativeness in the sample, through probability sampling and weighting, we have only weighted the sample using a limited number of variables. Moreover, the low response rate may introduce a non-response bias that could influence our assessment of use and perceptions of risk and harm, although probability sampling was undertaken to mitigate this bias. This survey relies on self-report which is known to underestimate substance use. Thus, our estimates of use may be low and we may have misclassification bias between users and non-users. However, given that our reported rates of use are higher than other national estimates, we anticipate the impact of under-reporting to be lower than in other data sources. Lastly, this work was carried out at a specific point in time which may not reflect the steady state rates and patterns of use that may eventually occur following legalization.

Conclusion

In conclusion, this study provides a better understanding of public use and perceptions of marijuana risks and harms. The findings of this survey are informative content to developing public policy. These results will likely change with time, and repeating this survey pursuant to legalization will be particularly informative as the prevalence and frequency of use will shape public opinion. Moreover, given the widespread acceptability of use and the correspondingly high proportion who believe that marijuana is neither harmful nor addictive, this will challenge health messaging and will require serious consideration in the regulatory regime which accompanies legalization.

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An Integrated Needs-Based Approach to Health Service and Health Workforce Planning: Applications for Pandemic Influenza

Démarche axée sur les besoins intégrés pour les services
de santé et la planification de la main-d'œuvre en santé :
application à une pandémie d'influenza



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Abstract

Healthcare systems must be responsive to the healthcare needs of the populations they serve. However, typically neither health services nor health workforce planning account for populations' needs for care, resulting in substantial and unnecessary unmet needs. These are further exacerbated during unexpected surges in need, such as pandemics or natural disasters. To illustrate the potential of improved methods to help planning for these types of events, we applied an integrated, needs-based approach to health service and workforce planning in the context of a potential influenza pandemic at the provincial level in Canada. This application provides evidence on the province's capacity to respond to surges in need for healthcare and identifies specific services which may be in short supply in such scenarios. This type of approach can be implemented by planners to address a variety of health issues in different contexts.

Résumé

Les systèmes de santé doivent se montrer réactifs aux besoins de santé des populations qu'ils desservent. Cependant, habituellement ni les services de santé ni la planification de la main-d'œuvre en santé tiennent compte des besoins des populations en termes de soins, ce qui donne lieu à d'importants besoins inutilement non comblés. La situation s'exacerbe davantage quand il y a une intensification imprévue en matière de soins, tels que les pandémies ou les désastres naturels. Afin d'illustrer le potentiel des méthodes améliorées pour faire face à ce type de situation, nous avons appliqué une démarche intégrée axée sur les soins aux services de santé et à la planification de la main-d'œuvre en santé dans le contexte d'une éventuelle pandémie d'influenza au niveau provincial, au Canada. Cette application permet de dégager des données sur la capacité de la province à réagir à l'intensification des besoins en santé et permet de repérer les services précis qui pourraient présenter une carence dans ce type de scénario. Ce genre de démarche peut être utilisé par les planificateurs pour traiter une variété d'enjeux de santé dans divers contextes.

Introduction

Because the effectiveness of healthcare services is directly contingent on the health human resources (HHR) who provide them, HHR planning must be integrated with health service planning. Further, in order for healthcare systems to effectively address the needs of the populations they serve, the planned levels of services and, by extension, the HHR to provide them, must be derived from the needs for care in the population. In practice, however, HHR planning is typically conducted in isolation from health service planning, and population health needs are seldom accounted for by either process (Birch 1985; Birch et al. 2007; Eyles et al. 1993; Mejía and Fülöp 1978; Ono et al. 2013). The results of this failure in planning are apparent in healthcare systems worldwide where healthcare needs frequently go unmet because the services required to address them and/or the HHR necessary to deliver those services have not been planned in accordance with needs for care in the population. These failures have even more unfortunate consequences during surges in need such as natural disasters or pandemics.

In recent years, progress has been made in addressing these planning failures. More comprehensive planning approaches in which (a) estimates of the required number and type of HHR are calculated as a function of estimates of the number and type of healthcare services required and (b) estimates of the number and type of healthcare services required are calculated as a function of measures of population health – have been applied to a range of health conditions and planning contexts. Examples include:

- ✦ caring for older adults in Canada (Tomblin Murphy et al. 2013b) and New Zealand (New Zealand Department of Health 2011a);
- ✦ dental services for schoolchildren in Thailand (Tianviwat et al. 2009) and for adults over age 65 in England (Gallagher et al. 2013);
- ✦ diabetes care in Australia (Segal and Leach 2011) and New Zealand (New Zealand Department of Health 2011b); and
- ✦ maternal health services in Guinea (Jansen et al. 2014).

Several studies have applied similarly comprehensive approaches to plan for HIV/AIDS services in various countries. These include analyses in, for example, Chad and Tanzania (Kurowski et al. 2004, 2007), sub-Saharan and low- and middle-income non-sub-Saharan Africa (Bärnighausen et al. 2007), Zimbabwe (Hallett et al. 2011), Zambia (Goma et al. 2014) and South Africa (Bärnighausen et al. 2007, 2016).

Such approaches represent important advances to more traditional planning methods which typically (1) do not consider population health needs, (2) consider population health needs but only one type of HHR such as physicians or (3) consider population health needs but do not derive HHR requirements from service requirements. Many studies have used these more common types of approaches over the past few decades, such as those by Crettenden et al. (2014), Tomblin Murphy et al. (2014) and Bruckner et al. (2011), respectively.

Building on this evidence base, the objectives of this paper are to:

1. demonstrate the application of an integrated, needs-based approach to healthcare service and HHR planning in the context of an influenza pandemic; and
2. demonstrate methodological advancements in the practical application of such an approach.

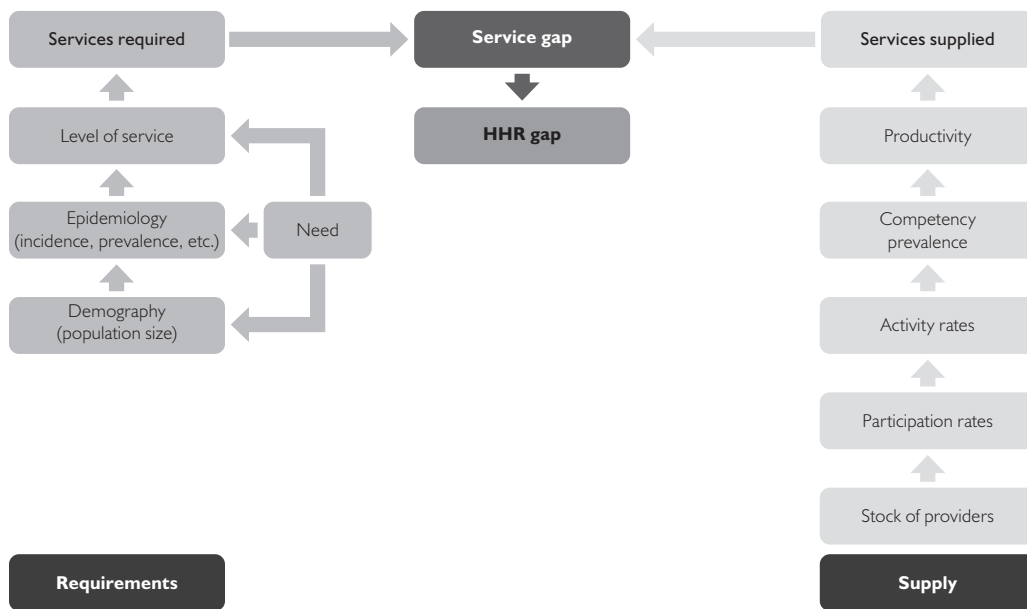
This research was conducted as part of a study funded by the Canadian Institutes of Health Research and the Nova Scotia Health Research Foundation in two Canadian jurisdictions. For the purposes of this paper, only the findings from one jurisdiction are reported.

Methods

The methods build on an integrated needs-based planning approach that was pilot-tested by Tomblin Murphy and colleagues (2013a) in the context of pandemic planning in one District Health Authority (DHA) in Nova Scotia, Canada. Under this approach, two quantities

are estimated and compared under different scenarios: (1) how many people in a particular population would be expected to need a particular healthcare service (requirements) and (2) how many people can be provided with that service by the existing health workforce (supply). Having identified pandemic influenza as the particular condition to be addressed, the process to estimate service needs requires knowledge of the size of the population, the expected incidence and severity of influenza within that population (i.e., levels and distribution of health), the range of healthcare services required for persons in each level of health and the frequency with which each service is required by persons in different levels of severity. Estimating the supply of services requires information on the supply of licensed HHR of different professions, their levels of direct care participation and activity, the prevalence of the competencies to provide each of the services under consideration, and the rates at which they can be expected to perform those services (Tomblin Murphy et al. 2013a, 2013b). The relationships between these various planning parameters are shown in Figure 1, which illustrates the study’s underlying analytical framework.

FIGURE 1. Integrated needs-based HHR planning framework (Tomblin Murphy et al. 2013b)



HHR = health human resources.

In the present study, the approach was expanded to the entire province of Nova Scotia (population 943,000). The range of potentially required healthcare services identified in the pilot study served as the first “draft” for this study, and was specific to clinical services and did not include other important but non-clinical services that would be required during a pandemic, such as mass media communications. These were then reviewed and updated by an infectious disease specialist before being validated by a Steering Committee made up of local healthcare policy makers and clinicians (Appendix 1, available at: <http://www.longwoods.com/content/25193>).

Because the timing and nature of pandemics are uncertain, this approach is designed to accommodate different assumptions – including age-specific incidence or “attack” rates and distributions of severity – so that planners can assess system capacity to respond to a range of potential pandemic scenarios. To illustrate this capacity, historical data from past influenza pandemics in 2009 (Nova Scotia Department of Health 2010; Smetanin et al. 2010) and 1918 (Pike 2011) were applied to the most recent data on Nova Scotia’s population and health workforce. Although Nova Scotia-specific data on the 2009 pandemic are available, the data on the other pandemic are global in scope. These data are summarized in Appendix 2 (available at: <http://www.longwoods.com/content/25193>).

The proportions of people who could be expected to require each service were estimated at each of four levels of severity: those without influenza, those with influenza but only mildly ill (i.e., who may need some out-patient care), those acutely ill with influenza (i.e., requiring in-patient care) and those critically ill with influenza (i.e., requiring intensive in-patient care). Estimates reported by Tomblin Murphy et al. (2013a), were adjusted for the current application by an infectious disease specialist on the research team. Importantly, these estimates were based on the question of what services these individuals would require given their health status as opposed to, for example, what services may already be available given specific resource constraints. These measures are referred to as “level of service” estimates.

Data on population size and demographics (Statistics Canada 2015), when combined with the data on pandemic incidence and severity, yielded estimates of the number of people in the province who would have influenza with different degrees of severity. These were multiplied by severity-specific level of service values to produce estimates of the number of people in the province likely to require each service in the event of an influenza pandemic with a particular epidemiological profile.

Data to estimate the supply of each service were obtained from multiple sources. For regulated professions, headcounts of those holding licenses to practice were provided by their respective regulatory colleges, whereas headcounts for unregulated professions were taken from administrative records of each of the province’s DHAs. Participation levels for each regulated profession were calculated by dividing the numbers used by DHAs by the numbers holding licences to practice in the province. In the absence of a reliable source of data on participation levels among non-regulated professions in the province, their supplies were modelled as if their participation level was 100%. Profession-specific activity levels were estimated based on data from administrative records, using 40 hours worked per week as a benchmark (e.g., someone who worked an average of 36 hours per week would have an activity level of 90%).

An attempt was made to estimate the final two parameters of the analytical framework – competency prevalence and productivity – using survey methods similar to those described in the pilot study (Tomblin Murphy et al. 2013a). The survey asked respondents to self-assess their competency to provide each pandemic service on a five-point scale with the following values: 1 = I have never been trained to provide this service; 2 = I have been

trained to provide this service but do not currently feel competent to provide it; 3 = I could provide this service with some supervision; 4 = I feel competent to provide this service; and 5 = I feel competent to provide this service and could train others to provide it. These response categories were developed to allow planners to consider the feasibility of, among other strategies, “skilling up” HHR currently working in administrative roles to provide some direct patient care in the event of a pandemic. Because of a low (10%) response rate, alternative methods of estimating these parameters were developed.

To estimate the prevalence of the competencies required to deliver each service in the province, the list of potentially required services was compared with descriptions of the core competencies of each profession specified by their respective regulatory colleges. Based on this comparison, a “map” showing whether each service was deemed to be within the competencies expected of each profession – and if so, at what level of training, from entry-to-practice through various additional certifications – was developed. This map was cross-referenced with relevant provincial legislative and regulatory frameworks. An initial draft map was revised based according to feedback from professional colleges (Appendix 3, available at: <http://www.longwoods.com/content/25193>). Once complete, the map identified which of the required services could, under existing professional regulatory structures, be performed by licensed members of each profession in the province.

To estimate productivity at the team level, multi-professional panels were convened with participants from 12 different health professions. Separate panels were convened to discuss influenza care at the different levels of severity identified above. These panels were presented with the list of potentially needed services for those levels of illness and asked to answer the following questions:

1. What team configurations would be appropriate to provide this “basket” of services to people with influenza of this severity?
2. How many patients could such a team, providing quality care, be reasonably expected to care for, over a single eight-hour shift?

The panels collectively identified 30 different potential team configurations across the four levels of patient severity. These ranged in complexity from solo physician or nurse practitioner (NP) practices vaccinating 100 healthy patients per shift to, for example, a team of four care assistants, one dietitian, three licensed practical nurses (LPNs), one physician, one NP, one pharmacist, one physiotherapist, two physiotherapy assistants, two registered nurses (RNs) and one respiratory therapist (RT) caring for 25 acutely ill patients per shift. In several configurations pertaining to vaccinating healthy people, it was noted that an additional team member, with some level of healthcare training but not necessarily pertaining to influenza, could administer screening questionnaires or monitor patients following their vaccinations. These could include professionals such as occupational therapists or dental hygienists who might otherwise not play a major role in an influenza pandemic response.

Using these data, analyses were performed to identify potential shortages at two levels: specific types of HHR and specific services. In the latter case, the information from the competency maps, in combination with the other measures of the existing supply of each type of HHR in each jurisdiction, allowed for the estimation of the numbers of full-time equivalent (FTE) personnel available and competent to provide each potentially required service. These were compared with the estimates of the number of people likely to require each service in the event of a pandemic, allowing for the identification of the services required most often relative to the availability of personnel to provide them. In this way, specific services for which the capacity to provide is the most “scarce” were identified. Lacking adequate data to allow for service-specific estimates of productivity (e.g., the average amount of time required to perform each service per patient), it was not possible to calculate the number of times each service could be provided and thus estimate service-specific gaps.

To identify potential shortages of specific types of HHR (as opposed to specific services) in the event of a future influenza pandemic, each of the suggested teams’ productivity was applied to the numbers of patients expected to have each level of illness to estimate FTE numbers of each type of HHR required under that configuration. These estimates were then compared with existing FTE supplies in the province to identify gaps.

The study’s methods and findings were discussed with provincial healthcare stakeholders at a day-long workshop with a view toward facilitating its broader application to health service and HHR planning in the province. These stakeholders included members of the Steering Committee as well as representatives of the DHAs, regulatory colleges and professional associations.

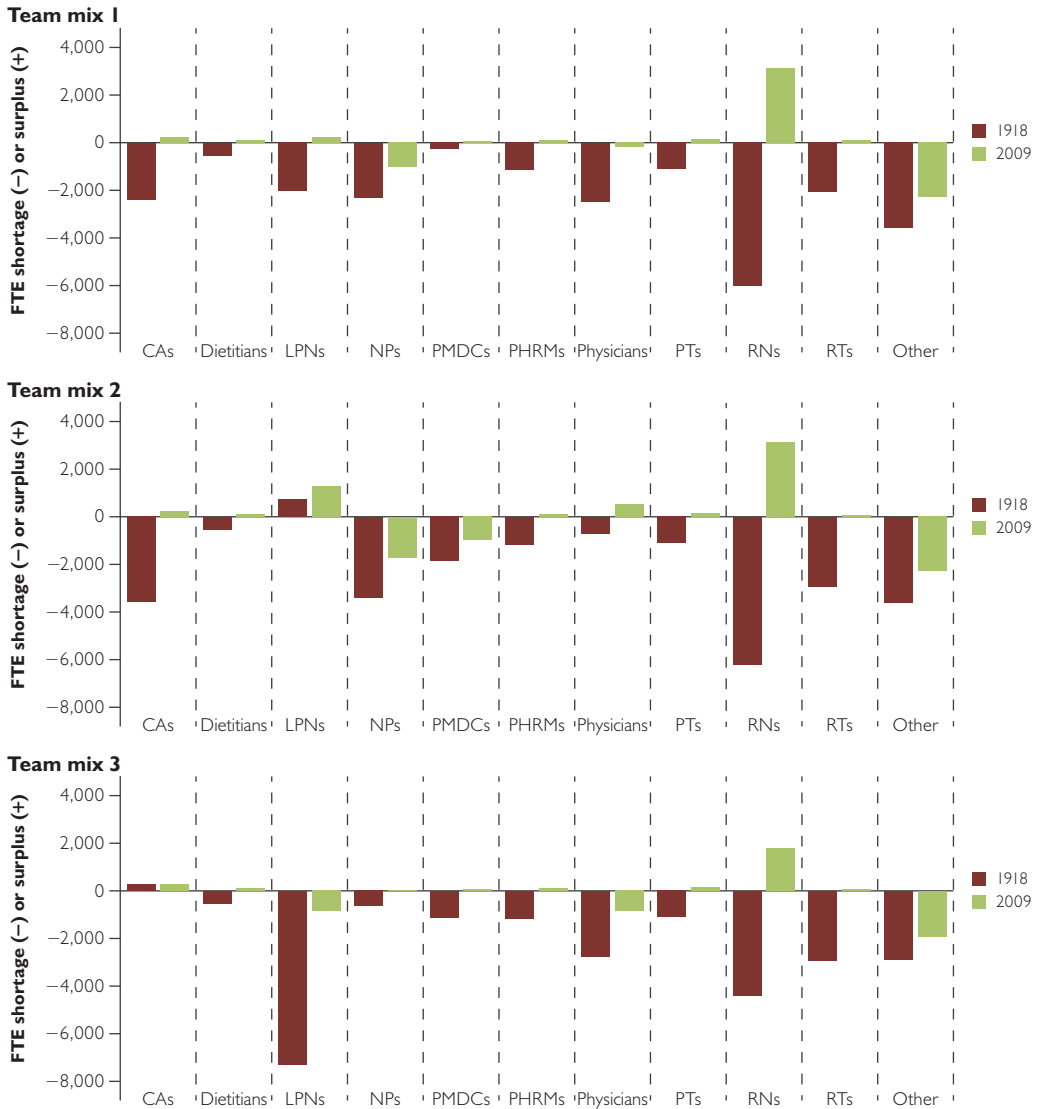
Results

There are many possible combinations of the different teams suggested by the panels. The results of the gap analysis for three such configurations based on the profiles of the 1918 and 2009 influenza pandemics in terms of the overall attack rate and distribution of severity are provided in Figure 2.

In each of these scenarios, there are enough of some types of HHR but not enough of others to respond to the simulated pandemic. The simulated shortages are more prevalent across types of HHR and larger in magnitude under the more severe pandemic, to the point that the sizes of the simulated shortages are greater than the entire existing provincial supplies of some of these professions.

The results shown in Figure 2 are based on the assumption that current levels of participation in direct patient care and hours worked would apply in the event of another influenza pandemic. These levels may be different during a pandemic. As an example of such a scenario, the same analysis was undertaken using two different assumptions: all those licensed to provide direct patient care do so, and all those providing direct patient care work full-time (an “all hands on deck” scenario). In this scenario, Nova Scotia would have enough FTEs of most types of HHR to respond to a pandemic similar to that of 2009, but not enough to respond to one similar to the 1918 pandemic.

FIGURE 2. Simulated Nova Scotia HHR gaps based on 1918 and 2009 pandemic profiles



CAs = care aides; HHR = health human resources; LPNs = licensed practical nurses; NPs = nurse practitioners; PHRMs = pharmacists; PMDCs = paramedics; PTs = physiotherapists; RNs = registered nurses; RTs = respiratory therapists.

Results of service-specific analysis for the scenarios based on the 1918 and 2009 pandemic profiles are provided in Table 1, which shows estimates of: (1) the 10 services that, in each scenario, would be required most in the population, (2) the numbers of FTE providers who are competent to provide these services, and (3) based on these two values, the number of times each competent FTE would be required to provide each service over the four-week peak of the pandemic.

TABLE 1. Most-needed services in Nova Scotia under simulated influenza pandemic by scenario (1918 vs. 2009 pandemic profiles)

Service	Number of patients requiring		Number of FTEs competent	Required productivity (services/FTE/month)	
	1918	2009		1918	2009
Recommend supports in the home for personal care/ activities of daily living as required	583,827	834,852	6,760	58	87
Administer vaccine	512,295	664,087	6,466	53	73
Document vaccination according to policy and regulations	512,295	664,087	6,466	53	73
Take a medical history relevant to immunization, noting contraindications, allergies, etc.	512,295	664,087	6,586	52	71
Recognize initial adverse events (e.g., anaphylaxis) occurring in community immunization clinics	512,295	664,087	6,586	52	71
Monitor for adverse events associated with immunization among members of the public (surveillance)	512,295	664,087	6,586	52	71
Obtain informed consent for immunization	512,295	664,087	6,762	51	69
Screen for eligibility for immunization	512,295	664,087	7,109	48	66
Interpret the results of history, physical exam, chest X-ray and laboratory tests, leading to a diagnosis	71,532	170,765	608	78	198
Assess nutritional and hydration needs of patient	71,532	170,765	6,466	7	19

FTE = full-time equivalent.

The services required most often are the same in each pandemic scenario, but they are required by more people for the more severe pandemic. In both scenarios, making diagnoses based on histories, exam and test results is most “scarce” in terms of the ratio of numbers of patients requiring that service to the number of FTE providers with the competency to provide it. Eight of these 10 services pertain mainly to providing mass vaccinations and as such would be required by large numbers of people. However, there are over 6,000 FTE providers competent to provide these services. In contrast, the “most scarce” service in both scenarios – making a diagnosis – would only be required by those patients who are (or suspected to be) ill, yet there are far fewer (about 600) FTE providers competent to provide this service.

Discussion

The results suggest that Nova Scotia likely has sufficient HHR necessary – in terms of numbers and competencies – to respond to an influenza pandemic similar to that which occurred in 2009 provided that available qualified personnel are fully deployed to this purpose. Although the profession-level results included shortages of at least one profession in every team combination for each type of pandemic simulated, the service-level results suggest that the provincial health workforce as a whole would have the capacity to respond to even a severe pandemic. The highest simulated productivity level required is just under 200 diagnoses per FTE per month; this seems achievable given that the Nova Scotia physicians

provided an average of 218 consultations per physician per month in 2014 (CIHI 2015). The results suggest that Nova Scotia would not have sufficient HHR to respond to a more severe pandemic similar to that which occurred in 1918.

Participants in the stakeholder workshop reported that the results were plausible given their recent experiences, and agreed that the approach was useful for informing pandemic planning specifically and for workforce and health service planning more broadly. The conceptual complexity of this HHR approach was perceived as a potential barrier to uptake. This perception is understandable given that the participants were unfamiliar with this innovative approach and would need time to become familiar with its use. Furthermore, traditional approaches to HHR planning, such as the use of provider:population ratios, may be simpler but are not adapted for the particular setting to which they are applied, and thus may be inaccurate. Despite the fundamental flaws of such simple approaches being articulated by key stakeholders such as the WHO since at least the 1970s (WHO 1971), their use remains prevalent among governments and healthcare organizations worldwide (Ono et al. 2013; Tomblin Murphy et al. 2016). Collaborative, long-term partnerships between researchers, clinicians and policy- and decision-makers are critical to ensuring that governments and healthcare organizations develop the political and technical capacity to undertake planning to meet the needs of the populations they serve. Toward this broader aim, in the present study the research team included both clinicians and policy- and decision-makers, and the broader communities of researchers, policy- and decision-makers and clinicians were invited to review and provide input on the study methods and findings at multiple points during and after its implementation.

Assessing the provincial health workforce's overall capacity to respond to a pandemic is central to pandemic planning. Three other crucial HHR policy issues which will affect Nova Scotia's pandemic response to a pandemic but which are outside the scope of this study are: (a) the way in which provincial resources are managed and deployed within the province; (b) the degree to which Nova Scotia's HHR could be relieved of their existing responsibilities to respond to a pandemic and (c) the availability of other, non-human resources, such as ventilators, vaccines and hospital beds. The Nova Scotia Department of Health (2010)'s report on its response to the 2009 H1N1 pandemic addresses these issues indirectly via three points:

- Purchasing 90 additional ventilators, developing a protocol to prioritize the use of intensive care beds and working with the federal government to have more involvement in the process of approving and acquiring vaccines.
- The establishment of a provincial "good neighbour" protocol to allow the workforce to more easily provide care through different DHAs and other organizations in the event of staff shortages during emergency situations.
- The establishment of two alternate means for members of the public to obtaining influenza information and care – a telephone consultation service and 15 dedicated

influenza assessment centres separate from existing healthcare facilities – is thought to have significantly reduced requirements for influenza care from doctor’s offices, clinics and emergency departments.

The degree to which existing HHR could potentially be “diverted” from their existing duties to respond to a pandemic could be analyzed through the model’s participation (e.g., by reserving some percentage of the available workforce for pre-existing, non-pandemic-related care) and/or activity (e.g., by reserving some percentage of the available workforce’s working hours for pre-existing care) parameters. Because of space constraints, such analyses have not been included here. Other examples of analyses not included here – but which are possible through the model – include estimating the impacts of policies aimed at improving healthcare productivity, such as training to promote and support more collaborative care between different types of HHR.

More broadly, the scope of the study was specific to human resources as opposed to non-human resources. Although the capacity of health systems to respond to pandemics (or any other health issue) will depend on the adequacy of available human and non-human resources, we know of no integrated, needs-based service planning model that includes both human and non-human resources. A recent systematic review of HHR and health labour market analyses identified this as a gap across high-income Organisation for Economic Co-operation and Development countries (Tomblin Murphy et al. 2016).

The analyses were affected by some important data limitations which must be considered when interpreting the results. The model can accommodate any updated or improved input data as they become available, at which time the analyses can be re-run.

- The epidemiological profile of a future influenza pandemic cannot be accurately predicted. The data used to create these results, because they are based on responses to actual influenza pandemics, are biased by the availability of workforce and other healthcare resources such as vaccines, and may therefore underestimate the potential severity of a similar future pandemic.
- The level of service estimates, although informed by clinical experience, knowledge of current evidence and established best practices, may still be subject to professional bias.
- The different team configurations and their associated estimated productivity values were based on the professional opinions and experiences of panel participants as opposed to empirical analysis or other evidence that may have been more rigorous and less subject to potential bias.
- The estimated participation and activity levels for different types of HHR were based on data from only one DHA and only some of the included types of HHR – care aides, dietitians, the nursing professions, pharmacists and physiotherapists – and thus may not accurately represent the values of these levels at the provincial level.
- For the service-specific analysis, the mapping of influenza care services to the respective competencies of different types of HHR is an imperfect means of estimating the

prevalence of these competencies among the members of these professions. This is because, despite their being required as a condition of entry to practice, not all members of a given profession may possess each of these competencies at a given time. By the same token, clinicians may have gained competency in performing other services beyond those required for entry to practice without having been formally certified as such.

These limitations notwithstanding, the results illustrate the application of a healthcare planning approach in which planning for healthcare services and planning for HHR are interdependent, and in which both processes are directly contingent on measures of population health. Although a wide range of simulation tools exist to guide influenza pandemic resource planning, most of which incorporate consideration of different epidemiological parameters (Van Kerkhove and Ferguson 2012), we are not aware of any that also integrate planning for specific influenza services with planning for the HHR required to provide them. For example, the AsiaFluCap simulator (Stein et al. 2012) calculates HHR requirements based on specific staffing:bed ratios.

Moreover, the demonstration of the competency mapping process as an objective and systematic means of estimating the prevalence of particular competencies across a health workforce has applicability across health system and HHR planning. It is considerably less burdensome on practicing HHR than a lengthy survey, and less subject to the low response rates and selection biases that may accompany such instruments. In contrast to other methods of assessing the prevalence of specific competencies within a health workforce, competency mapping lends itself well to application across multiple health issues and on a regular basis, providing planners with a means of more comprehensively, regularly and systematically assessing the degree to which the capacities of their respective health workforces are aligned with the needs of the populations they serve.

In the present study, analyses were specific to a single population health issue – pandemic influenza. Other applications of similar planning approaches provide examples of how these can be broadened to apply to multiple conditions or to entire populations. For example, in the present study, pandemic influenza was chosen as the issue of interest from the outset. One alternative approach would be to begin the study by selecting the specific health issue(s) to be addressed; this approach was used by Goma and colleagues (2014) in planning for malaria and HIV/AIDS in Zambia. Another application of such an approach in Canada began by planning for the top five health issues facing the populations being studied and eventually expanded to eight; the authors noted that with each added condition, the number of unique services (and associated competencies) to be included in the model was smaller (Tomblin Murphy et al. 2013b). This finding suggests that the vast majority of healthcare services required by a population could be feasibly incorporated into a planning approach such as the one used in the present study without the underlying model becoming unwieldy.

Conclusions

The results of these analyses suggest that the publicly funded healthcare system in Nova Scotia has the overall capacity to cope with a mild influenza epidemic. The degree to which the province is able to respond to such an event is directly contingent not only on this overall capacity, but also on how it is deployed and managed across different parts of the province.

More broadly, this study demonstrated the application of an integrated, needs-based approach to healthcare service and HHR planning in the context of a potential future influenza pandemic at the provincial level in Canada. The results provide insight into this jurisdiction's capacity to respond to such surges in its population's need for healthcare, and identified specific services which may be in short supply during such an event. Although the included data and analyses are specific to influenza, the general approach can also be applied to other diseases which result in surges in health needs, such as Ebola.

Finally, this paper described the application of competency mapping as an advancement in the practical application of such approaches to planning. This method increases the ease with which these types of needs-based, integrated approaches to health service and HHR planning can be systematically implemented by planners to address a variety of health issues in different contexts.

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Is Canadian Healthcare Affordable? A Comparative Analysis of the Canadian Healthcare System from 2004 to 2014

Les soins de santé sont-ils abordables au Canada?
Analyse comparative du système de santé canadien
de 2004 à 2014



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Abstract

Objective: To compare cost-related non-adherence (CRNA), serious problems paying medical bills and average annual out-of-pocket cost over time in five countries.

Methods: Repeated cross-sectional analysis of the Commonwealth Fund International Health Policy survey from 2004 to 2014. Responses were compared between Canada, the UK, Australia, New Zealand and the US.

Results: Compared to the UK, respondents in Canada, Australia and New Zealand were two to three times and respondents in the US were eight times more likely to experience CRNA; these odds remained stable over time. From 2004 to 2014, Canadian respondents paid US \$852–1,767 out-of-pocket for care. The US reported the largest risks of serious problems paying for care (13–18.5%), highest out-of-pocket costs (US \$2,060–3,319) and greatest rise in expenditures.

Interpretation: Over the 10-year period, financial barriers to care were identified in Canada and internationally. Such persistent challenges are of great concern to countries striving for equitable access to healthcare.

Résumé

Objectif : Comparer, dans cinq pays et au cours du temps, le non-respect lié aux coûts (NRLC), les problèmes graves concernant le paiement des factures pour services médicaux et la moyenne annuelle des dépenses non remboursées.

Méthodes : Analyse transversale répétée des enquêtes internationales du Fonds du Commonwealth sur les politiques de santé, de 2004 à 2014. Nous avons comparé les réponses du Canada, du Royaume-Uni (R.-U.), de l'Australie, de la Nouvelle-Zélande et des États-Unis (É.-U.).

Résultats : Comparativement au R.-U., les répondants du Canada, de l'Australie et de la Nouvelle-Zélande sont 2 à 3 fois plus enclins, et ceux des É.-U. 8 fois plus enclins, à vivre une expérience de NRLC; ces probabilités demeurent stables en fonction du temps. De 2004 à 2014, les répondants canadiens ont indiqué des dépenses non remboursées de 852 à 1 767 \$US. Ceux des É.-U. ont indiqué les plus grands risques de problèmes graves concernant le paiement pour les soins (de 13 à 18,5 %), les dépenses non remboursées les plus élevées (entre 2 060 et 3 319 \$US) et la plus grande croissance des dépenses.

Interprétation : Pour la période de dix ans, nous avons repéré les obstacles financiers pour les soins au Canada et à l'international. De tels défis constants constituent une préoccupation pour les pays qui s'efforcent d'assurer un accès équitable aux services de santé.

Introduction

Canadians are intensely proud of Medicare (Mendelsohn 2002) – the national, publicly funded health insurance program that provides first-dollar coverage for medically necessary physician and hospital services (Allin and Watson 2011). The program comprises 13 provincial and territorial healthcare systems and insurance plans, which share common elements

and basic standards of coverage (Naylor et al. 2015). That said, there are still a variety of medical treatments and services not publicly covered and whose costs are often borne directly by Canadians as they access them.

Typically, such non-insured health services are provided or accessed outside of the hospital setting, potentially by non-physician healthcare providers. Such items can include routine dental care, chiropractic services, massage and physical therapy, routine vision care and – perhaps the largest noted gap – out-patient pharmaceuticals (Gagnon 2014). Currently, the costs of out-patient prescription drugs are covered through a patchwork of public provincial/territorial and private insurance plans, which must often be supplemented by out-of-pocket payments by patients at the point of use (Daw and Morgan 2012).

Approximately one in ten Canadians experience cost-related non-adherence (CRNA) to prescription drugs (i.e., inability to fill a prescription because of cost), particularly among those in poorer health and with chronic conditions, with lower income and without drug insurance (Campbell et al. 2014; Law et al. 2012). Further, with the increasing cost of prescription drugs and the significant shift of care out of the hospital, the financial burden to patients may be rising over time (Morgan et al. 2015).

Internationally, Canadians are not alone when it comes to experiencing financial barriers to care. Recent comparative analysis of 11 Organisation for Economic Co-operation and Development (OECD) nations found that nearly 7% of older adults in Australia and 17% in the US also experience CRNA relative to those in the UK (Morgan and Lee 2017). Yet despite these and similar findings (Hargreaves et al. 2015; Kennedy and Morgan 2006, 2009; Schoen and Doty 2004), little is known about the extent to which these relative financial barriers have evolved over time internationally.

For over a decade, the Commonwealth Fund has conducted the International Health Policy (IHP) survey to measure and monitor healthcare system performance internationally (Davis et al. 2014). The IHP survey ranks healthcare system performance based on the dimensions of quality, access, efficiency, equity and healthy lives (Davis et al. 2014). There are a series of questions pertaining to healthcare coverage, experience with administrative/financial burdens and out-of-pocket medical costs. The repeated collection of cross-sectional survey data offers rich insight into the perceived affordability of healthcare systems internationally and the evolution of these perceptions over time. To our knowledge, however, there have been no cross-national studies examining potential cost-related barriers to healthcare over time using multiple years of the IHP survey data.

The objective of the present study is to compare the odds of CRNA, private health insurance coverage, serious problems paying for medical bills, as well as the extent of average annual out-of-pocket cost reported by Canadians over time and relative to those in the UK, Australia, New Zealand and the US. This selection of countries has participated in the IHP survey since its inaugural survey year and represents “peer” countries often used to benchmark the Canadian healthcare system.

Methods

Data source

The Commonwealth IHP survey is an annual survey that measures and monitors health-care system performance internationally by ranking healthcare systems through a series of performance dimensions, including quality, access, efficiency, equity and healthy lives. The IHP survey is administered via telephone in each country with nationally representative cross-sectional samples of respondents (Davis et al. 2014). The IHP survey respondent population rotates on a triennial cycle between physicians, the general population (aged 18 years or older) and older and/or sicker adults. The latter group represents the highest users of the healthcare system and comprised: those aged 18 years or older (or 55 years or older after 2011) and/or in fair or poor health; who received medical care in the past year for a serious or chronic illness, injury or disability; experienced hospitalization for something other than uncomplicated delivery of a baby in the past two years or underwent major surgery in the past two years.

Sampling frames for each survey year were uniquely designed for each participating country, with landline random-digit dialling sampling approaches typically applied. In 2013, an overlapping-frame approach (contact through landline and cell phones) was introduced to account for the increasing number of cell-phone-only households (Rapoport et al. 2013). Respondent selection within a given household was random, based on the “most recent birthday” method (i.e., respondent aged 18 years or older who had the most recent birthday). Further details of the IHP survey methodology, including sampling strategy, interview procedures, weighting of data, data editing and cleaning for each year are available elsewhere (Blendon et al. 2003; Huynh et al. 2006; Schoen et al. 2005, 2007, 2009, 2011, 2013). Because this data set is publicly available and anonymized, institutional ethics review was not required.

Study period and population

Repeated cross-sectional data from the IHP survey was examined between 2004 and 2014. The study period reflects the most recent 10-year period in which the IHP survey was administered, with the 2014 survey being the last completed survey at the time this study was initiated. Only years in which the survey respondents were either part of general population or older and/or sicker adults were selected. Survey responses from Canadian respondents were compared to those from the UK, Australia, New Zealand and the US; all five countries have consistently participated in the IHP survey throughout the entire study period. To provide context for each of the comparator countries, select characteristics of national health insurance coverage and policies are provided for each country in Appendix 1 (available at: <http://www.longwoods.com/content/25192>). Among countries, the UK provides the most comprehensive provision of publicly funded health services, whereas the US provides the least comprehensive. While universal public health insurance is provided in Australia and New Zealand,

there are various cost-sharing mechanisms and private insurance coverage policies in place (European Observatory on Health Systems and Policies 2017). In addition, New Zealand has also been an international champion for fair-pricing policies for prescription drugs (Morgan et al. 2007). Therefore, collectively, these models offer an interesting range of comparators to assess the perceived financial barriers relative to the Canadian healthcare system.

Variables

OUTCOME DEFINITION

The outcomes of interest were defined by four survey questions that addressed potential cost-related problems to care. Specifically, the questions asked respondents if in the previous 12 months: (1) they did not fill a prescription because of costs (i.e., CRNA); (2) they had supplemental private health insurance paid through their employment or out-of-pocket; (3) they experienced serious problems paying their medical bills and (4) the extent of out-of-pocket payments made for medical treatments or services not covered through public or private insurance (e.g., costs for prescription medicines and treatments or therapies recommended by a doctor or another health professional). Binary outcome responses (i.e., 1 = yes, 0 = no) were tabulated for the first three questions, whereas the fourth question resulted in continuous outcome responses ranging in values from 1 to 999,997.

EXPOSURE AND INTERACTION TERM DEFINITION

The exposure of interest was the country of residence for a survey respondent. For each country, exposure was coded as dummy variables (e.g., 1 = Canada as country of residence, 0 = all other countries). In addition, year of survey was interacted with country of residence to explore whether temporal changes impacted the association with the outcomes of interest.

TABLE 1. Baseline characteristics for survey respondents in all countries

Characteristics	Survey year							
	General population (N = 41,098)				Older and/or sicker adults (N = 32,488)			
	2004	2007	2010	2013	2005	2008	2011	2014
Number of respondents								
Total	8,672	8,946	11,866	11,614	5,454	6,541	8,409	12,084
Canada	1,410	3,003	3,302	5,412	751	2,635	3,958	5,269
Australia	1,400	1,009	3,552	2,200	702	750	1,500	3,310
New Zealand	1,400	1,000	1,000	1,000	704	751	750	750
UK	3,061	1,434	1,511	1,000	1,770	1,200	1,001	1,000
US	1,401	2,500	2,501	2,002	1,527	1,205	1,200	1,755

TABLE 1. Continued

Characteristics	Survey year							
	General population (N = 41,098)				Older and/or sicker adults (N = 32,488)			
	2004	2007	2010	2013	2005	2008	2011	2014
Sex								
Males	4,671	5,323	7,380	6,509	2,260	2,312	3,048	5,073
Females	4,001	3,623	4,486	5,105	3,194	4,229	5,361	7,011
Age*								
18–24 years	638	487	639	903	279	242	282	0
25–34 years	1,448	1,174	1,407	1,501	656	602	713	0
35–49 years	2,688	2,681	2,998	2,835	1,285	1,610	1,976	0
50–64 years	2,216	2,641	3,542	3,463	1,568	2,189	2,784	5,191
≥65 years	1,682	1,963	3,280	2,912	1,623	1,898	2,654	6,893
Education[§]								
High school or less	3,711	3,238	4,706	4,113	2,665	2,778	3,567	5,223
Some college or university	2,569	2,837	2,996	3,861	1,518	1,968	2,371	3,431
College or university graduate or higher	2,325	2,716	3,141	3,391	281	1,669	2,274	3,093
Household income[†]								
First quintile (lowest)	1,409	1,548	1,073	1,153	648	704	754	779
Second quintile	2,381	2,423	2,428	2,490	1,032	1,242	1,567	1,789
Third quintile	1,697	1,786	3,018	2,590	1,107	1,286	1,770	2,795
Fourth quintile	1,361	1,298	2,144	1,982	1,011	1,172	1,556	2,372
Fifth quintile	1,396	1,290	2,220	2,064	1,326	1,562	1,863	2,726
Not sure	208	219	285	364	210	–	282	343
Self-assessed health status[‡]								
Excellent	1,550	1,861	2,482	2,440	382	540	773	779
Very good	3,225	3,423	4,565	4,536	935	1,338	2,003	1,789
Good	2,563	2,261	3,237	3,088	1,375	1,735	2,617	2,795
Fair	959	1,006	1,149	1,101	1,913	2,147	2,252	2,372
Poor	345	377	383	412	842	762	750	2,726
Not sure	19	12	26	21	6	16	12	343

*Total survey responses for older and/or sicker adults: 32,445. [§]Total survey responses for the general population: 39,604 and older and sicker adults: 30,838.

[†]Total survey responses for the general population: 38,827 and older and/or sicker adults: 29,896. [‡]Total survey responses for the general population: 41,041 and older and/or sicker adults: 31,203.

COVARIATES

We considered a number of covariates that were previously found to be independently associated with CRNA (Kennedy and Morgan 2006, 2009; Law et al. 2012) and thus may serve as potential confounders in our analyses. These covariates included age, sex, level of education, income level and self-assessed health status. All variables were included as categorical variables, as defined in Table 1.

Data analysis

The healthcare needs of the older and/or sicker adult populations were assumed to differ from those of the general population; therefore, descriptive and regression analyses were stratified by the two respondent types.

For binary outcome data, the frequency of responses were tabulated into percentages based on the total number of respondents from each country for a given survey year. The reported annual out-of-pocket expenses, expressed as continuous data, were inflation-adjusted using the domestic gross domestic product deflator for each country (World Bank 2017) and converted to 2014 US dollars using purchasing-power parities (OECD 2017b). Cost data were presented as average out-of-pocket costs plus or minus standard error by country for each survey year.

Multivariable logistic regression was used to compare the odds of CRNA, having private insurance and serious problems paying for medical bills among respondents in all five comparator countries, adjusting for year and the additional covariates described above. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) – first, controlling for the covariates alone (Model 1) and then with the interaction of year and country (Model 2) – were calculated for each country. Due to the non-normal distribution of costing data, generalized linear models using a gamma distribution and log link, adjusting for year and the additional covariates, were developed to compare the association with country and reported out-of-pocket costs for care. Regression coefficients (β_1) and 95% CIs, adjusting for both the covariates alone (Model 1) as well as with the interaction term (Model 2), were calculated (and presented as the exponentiated value) for each country. For all statistical analyses, the significance level was set at $p = 0.05$. All analyses were conducted using STATA IC V13.1 statistical software.

Results

Survey respondents

During the study period, responses to the four selected survey questions were available from the selected respondent cohorts (i.e., general population and older and/or sicker adults) in eight of the IHP survey years. The total numbers of respondents in each country and their corresponding characteristics are summarized by survey year in Table 1. Broadly from 2004 to 2014, the total number of respondents in the general population and older and/or sicker adult cohorts increased over time. The number of respondents ranged from 751 to 5,412 in Canada, 701–3,552 in Australia, 704–1,000 in New Zealand, 1,000–3,061 in the UK and 1,200–2,501 in the US (Table 1).

Overall, within the general population cohort, more of the respondents were male, between the ages of 35 and 49 years, had a high school education or less, reported a household income in the second lowest quintile and described their health to be very good (Table 1). The older and/or sicker adult cohorts differed in that most were female, older (greater than 50 years old), reported higher household incomes (highest quintile) and assessed their health status as fair to poor. In the 2014 survey, the age inclusion criterion (greater than 55 years old) omitted the inclusion of respondents between 18 and 49 years old.

Cost-related non-adherence

In Canada, the proportions of respondents experiencing CRNA in the general population were relatively stable (ranging from 7.1% to 8.9%; Table 2). In contrast, the older and/or sicker adult cohort had the highest proportions of respondents who did not fill a prescription because they could not afford it (Table 2). Specifically, 19.8% of respondents in 2005 and 12.1% in 2011 reported not filling a prescription due to cost. Between all five countries, those in the UK and the US reported the lowest and highest proportions of CRNA, respectively, in both survey cohorts (Table 2).

TABLE 2. Categorical survey responses for the general population and older and/or sicker adults in all countries

	General population				Older and/or sicker adults			
	2004	2007	2010	2013	2005	2008	2011	2014
Cost-related non-adherence, no. of respondents reporting yes (%)								
Canada	125 (8.9)	229 (7.7)	283 (8.6)	384 (7.1)	148 (19.8)	367 (13.9)	478 (12.1)	345 (6.5)
Australia	146 (10.5)	111 (11.1)	365 (10.6)	172 (7.8)	133 (19.1)	113 (15.3)	209 (14.0)	158 (4.9)
New Zealand	126 (9.0)	994 (8.4)	987 (5.4)	992 (5.6)	127 (18.1)	118 (15.8)	80 (10.7)	34 (4.6)
UK	125 (4.1)	64 (1.7)	25 (1.7)	21 (2.1)	135 (7.8)	73 (6.2)	35 (3.5)	27 (2.7)
US	251 (17.9)	507 (20.4)	444 (17.8)	361 (18.0)	566 (37.2)	405 (33.8)	286 (23.9)	244 (14.2)
Private health insurance, no. of respondents reporting yes (%)								
Canada	885 (62.8)	1,901 (63.3)	1,992 (60.3)	3,451 (63.8)	420 (55.9)	1,560 (59.2)	2,410 (60.9)	2,929 (55.6)
Australia	744 (53.4)	619 (61.7)	1,950 (55.1)	1,059 (48.5)	341 (48.6)	428 (57.4)	869 (58.2)	1,924 (60.2)
New Zealand	600 (43.4)	494 (49.8)	414 (41.8)	354 (35.9)	299 (42.9)	281 (37.7)	317 (42.4)	251 (33.9)
UK	395 (12.9)	313 (21.8)	296 (19.6)	206 (20.6)	203 (11.5)	189 (15.8)	89 (8.9)	219 (21.9)
Serious problems paying medical bills, no. of respondents reporting yes (%)								
Canada	–	129 (4.3)	175 (5.3)	296 (5.5)	–	–	258 (6.5)	267 (5.1)
Australia	–	65 (6.5)	273 (7.7)	155 (7.1)	–	–	129 (8.7)	238 (7.3)
New Zealand	–	71 (7.1)	42 (4.2)	79 (7.9)	–	–	75 (10.0)	36 (4.8)
UK	–	21 (1.5)	27 (1.8)	13 (1.3)	–	–	10 (1.0)	40 (4.0)
US	–	385 (15.4)	411 (16.4)	369 (18.4)	–	–	222 (18.5)	228 (13.0)

Compared to the UK, Canadians in the general population were 2.74 times more likely to experience CRNA (Table 3). These odds were significantly lower than in the US (OR: 7.75 [95% CI: 6.68, 8.99]), but not statistically different than those in Australia (OR: 3.38 [95% CI: 2.89, 3.95]) or New Zealand (OR: 3.03 [95% CI: 2.52, 3.66]). The odds of CRNA among the general population in Canada (OR: 1.06 [95% CI: 1.01, 1.11]) and the US (OR: 1.06 [95% CI: 1.01, 1.11]) increased over time relative to the UK; the change in CRNA over time was not significantly different for those in Australia or New Zealand (Table 3). For older and/or sicker adult respondents in Canada, Australia, New Zealand and the US, the odds of CRNA compared to those in the UK were similar to their general population counterparts. However, no significant changes over time were observed in any country (Table 3).

Supplemental private insurance

Among the four countries with universal healthcare systems, Canada consistently reported the highest proportion of respondents with supplemental private health insurance – ranging from 60.3% to 63.8% in the general population and 55.6–60.9% in older and/or sicker adults – throughout the study period (Table 2). Compared to those in the UK, Canadian respondents in the general population and older and/or sicker adult cohorts were 4.74 and 5.57 times more likely to have private insurance, respectively (Table 3). These odds were similar for respondents in Australia (general population OR: 4.79 [95% CI: 4.39, 5.22]; older and/or sicker adults OR: 6.75 [95% CI: 5.93, 7.69]) and greater than those in New Zealand (general population OR: 2.22 [95% CI: 2.00, 2.46]; older and/or sicker adults OR: 2.46 [95% CI: 2.17, 2.80]) (Table 3). Relative to the changes in the UK, the odds of having private insurance in the general population decreased over time in all other countries, yet increased over time for older and/or sicker adults in Canada and New Zealand (Table 3).

Reported serious problems paying medical bills

The percentage of Canadians reporting serious problems paying their medical bills was stable from 2007 (4.3%) to 2013 (5.5%) in the general population and from 2011 (6.5%) to 2014 (5.1%) among older and/or sicker adults; these risks are similar to the Australian and New Zealand risks (Table 1). The highest proportions of individuals reporting serious problems paying for their medical bills were among those in the US, for both the general population and older and/or sicker adults; these findings were notably different from the 4% or less of respondents in the UK over the study period (Table 1). Canadians were approximately three times more likely to have serious problems paying for medical bills compared to those in the UK (general population OR: 3.27 [95% CI: 2.48, 4.32]; older and/or sicker adults OR: 2.43 [95% CI: 1.75, 3.39]); these odds were similar for those in Australia and New Zealand (Table 3). In addition, the general population and older and/or sicker adult cohorts in the US were 12.95 and 8.97 times more likely to experience serious problems paying for their medical bills, respectively. The odds for older and/or sicker adults in the US decreased significantly over time relative to the change in the UK (Table 3).

TABLE 3. Regression of country on cost-related non-adherence, having private insurance, serious problems paying medical bills and out-of-pocket costs for care

Country	General population				Older and/or sicker adults			
	Model 1* OR (95% CI)	p-value	Model 2 [§] OR (95% CI)	p-value	Model 1* OR (95% CI)	p-value	Model 2 [§] OR (95% CI)	p-value
Cost-related non-adherence								
UK	Referent							
Canada	2.74 (2.36, 3.19)	<0.0001	1.06 (1.01, 1.11)	0.031	2.45 (2.10, 2.86)	<0.0001	1.00 (0.95, 1.06)	0.982
Australia	3.38 (2.89, 3.95)	<0.0001	1.03 (0.98, 1.08)	0.293	2.63 (2.23, 3.11)	<0.0001	0.96 (0.91, 1.01)	0.112
NZ	3.03 (2.52, 3.66)	<0.0001	0.98 (0.93, 1.04)	0.585	2.74 (2.27, 3.30)	<0.0001	0.96 (0.90, 1.02)	0.197
US	7.75 (6.68, 8.99)	<0.0001	1.07 (1.01, 1.12)	0.014	8.49 (7.24, 9.94)	<0.0001	0.98 (0.93, 1.03)	0.456
Private health insurance								
UK	Referent							
Canada	4.74 (4.37, 5.14)	<0.0001	0.83 (0.81, 0.86)	<0.0001	5.57 (5.04, 6.16)	<0.0001	1.35 (1.30, 1.40)	<0.0001
Australia	4.79 (4.39, 5.22)	<0.0001	0.95 (0.93, 0.98)	0.001	6.75 (5.93, 7.69)	<0.0001	1.01 (0.95, 1.07)	0.858
NZ	2.22 (2.00, 2.46)	<0.0001	0.90 (0.86, 0.93)	<0.0001	2.46 (2.17, 2.80)	<0.0001	1.08 (1.03, 1.14)	0.001
Serious problems paying medical bills								
UK	Referent							
Canada	3.27 (2.48, 4.32)	<0.0001	1.04 (1.01, 1.08)	0.023	2.43 (1.75, 3.39)	<0.0001	0.98 (0.91, 1.05)	0.498
Australia	4.53 (3.42, 6.01)	<0.0001	0.99 (0.94, 1.04)	0.628	3.52 (2.51, 4.93)	<0.0001	0.97 (0.89, 1.05)	0.434
NZ	5.40 (3.94, 7.41)	<0.0001	0.98 (0.93, 1.04)	0.567	3.48 (2.38, 5.08)	<0.0001	0.80 (0.69, 0.93)	0.004
US	12.95 (9.85, 17.0)	<0.0001	1.03 (1.01, 1.06)	0.039	8.97 (6.40, 12.57)	<0.0001	0.92 (0.85, 0.99)	0.027
Country	Model 1* β1 (95% CI)	p-value	Model 2 [§] β1 (95% CI)	p-value	Model 1* β1 (95% CI)	p-value	Model 2 [§] β1 (95% CI)	p-value
Out-of-pocket costs								
UK	Referent							
Canada	2.06 (1.72, 2.46)	<0.0001	1.02 (0.97, 1.08)	0.481	1.63 (1.33, 2.00)	<0.0001	1.05 (0.98, 1.12)	0.145
Australia	2.06 (1.70, 2.49)	<0.0001	1.06 (1.01, 1.13)	0.042	1.69 (1.36, 2.11)	<0.0001	1.06 (0.98, 1.14)	0.128
NZ	1.31 (1.06, 1.63)	0.0014	1.03 (0.96, 1.10)	0.418	1.12 (0.87, 1.42)	0.381	1.08 (1.00, 1.17)	0.051
US	4.73 (3.94, 5.70)	<0.0001	1.07 (1.01, 1.14)	0.017	3.48 (2.79, 4.33)	<0.0001	1.01 (0.95, 1.09)	0.709

CI = confidence interval; OR = odds ratio.

*Model 1 adjusted for age, sex, education level, income level and self-assessed health status. [§]Model 2 adjusted for year of survey, age, sex, education level, income level, self-assessed health status and interaction of country and year of survey.

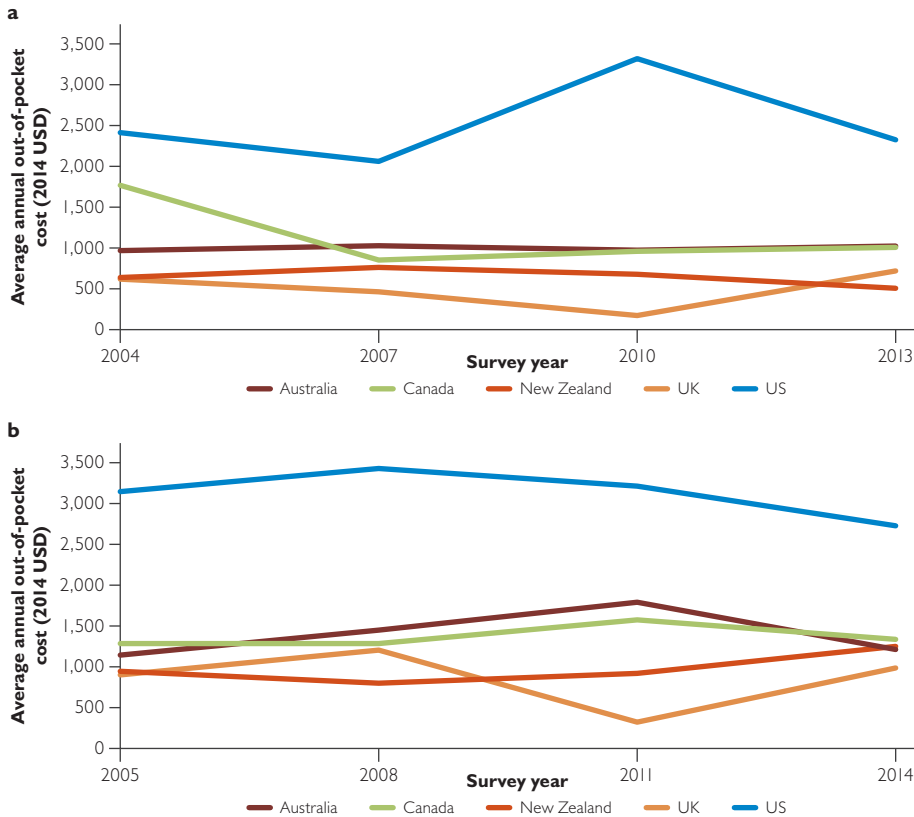
Average out-of-pocket costs

Comparable average out-of-pocket costs for medical treatments and prescriptions drugs not covered by either public or private health insurance were observed among respondents in the general populations of Canada, Australia and New Zealand (Figure 1a). The reported average annual out-of-pocket costs among Canadians in the general population ranged from \$852

in 2004 to \$1,007 (USD) in 2013. Respondents from the UK and US reported the lowest (ranging from \$172 to \$719) and the highest (ranging from \$2,061 to \$3,319) out-of-pocket expenditures, respectively (Figure 1a). The regression analysis further confirmed that the rise in out-of-pocket expenditures was positive in all countries relative to the UK (Table 3). The rise in costs was greatest for those in the US (β_1 : 4.73 [95% CI: 3.94, 5.70]) and significantly increased compared to the UK over time (β_1 : 1.07 [95% CI: 1.01, 1.14]; $p = 0.017$).

The average annual out-of-pocket costs reported by older/sicker adults in Canada ranged from \$1,101 in 2005 to \$1,145 (USD) in 2014. Canadians, Australians and New Zealanders in this cohort also reported stable and comparable out-of-pocket expenditures (Figure 1b). Older and/or sicker adult respondents in the UK and the US reported the lowest and the highest average out-of-pocket expenses, respectively. Over the study period, costs from older and/or sicker adults in the US ranged from \$2,696 in 2005 to \$2,338 in 2014 (Figure 1b). The rise in out-of-pocket costs relative to the UK was positive for all countries, similar between Canada, Australia and New Zealand, and highest in the US (β_1 : 3.48 [95% CI: 2.79, 4.33]). Over time, these changes in out-of-pocket costs were not significantly different than those observed in the UK (Table 3).

FIGURE 1. Average annual out-of-pocket payments for medical treatments and services reported among the (a) general population and (b) older and/or sicker adults in Canada, Australia, New Zealand, the UK and the US



Figures are inflation-adjusted using domestic gross domestic product (GDP) deflator and converted to 2014 USD using purchasing power parities. Error bars represent the standard error.

Discussion

Four outcomes addressing potential cost-related problems to care were examined using the Commonwealth Fund IHP survey data between 2004 and 2014. In Canada, we found that on average, 20% of all respondents experienced CRNA, over 50% had private health insurance and approximately 7% experienced serious problems paying for medical bills. The reported financial burden of healthcare was approximately \$852–1,767 for Canadian respondents in the general population and \$1,101–1,350 for older and/or sicker adults (USD). Benchmarking these metrics to the risks observed in the UK, we found that the odds of CRNA and serious problems paying for medical bills experienced by Canadians were relatively comparable to those in Australia and New Zealand, and lower than those reported by respondents in the US. Notably, relative to the UK, respondents in Canada, Australia and New Zealand were two to three times more likely to experience CRNA, and the odds were approximately eight times greater among respondents in the US. Among countries with universal healthcare systems, Canada also reported the highest proportions of respondents having supplemental private insurance. However, the odds of having supplementary private insurance relative to the UK were similar in Canada and Australia. Lastly, respondents in the US reported the largest risks of serious problems paying for medical bills, the highest average out-of-pocket costs for care as well as the greatest rise in these expenditures, which significantly increased compared to the UK over the study period.

To our knowledge, this is the first international comparison of these four potential cost-related problems to care over time using the IHP survey data. Although there have been previous studies that have identified financial barriers to care in Canada and abroad, they have been restricted to analyses of single IHP survey year data and, in particular, much focus placed on international comparisons of CRNA (Hargreaves et al. 2015; Kennedy and Morgan 2006, 2009; Morgan and Kennedy 2010; Morgan and Lee 2017; Schoen and Doty 2004). For example, Morgan and Lee (2017) examined the odds of CRNA among older and/or sicker adults in 11 countries from the 2014 survey. These authors found that respondents in the US, Canada and Australia were significantly more likely to report CRNA compared to their counterparts in the UK (Morgan and Lee 2017). The repeated cross-sectional analysis in our present study, along with the larger sample size, not only supports such findings, but also provides novel insight into how these odds of CRNA between the comparator countries have persisted over the 10-year study period.

Across all countries, the average proportion of respondents reporting serious problems paying for their medical services and treatments over the study period tended to be less than the proportion experiencing CRNA. There was insufficient information in the IHP survey responses to understand what constitutes a serious problem paying for medical bills and how that might vary across countries. It is likely that the social norms surrounding acceptability and patient understanding of out-of-pocket costs, particularly for prescription drugs, may differ across the countries (Ubel et al. 2013). For example, in the US, \$1,000 out-of-pocket may be a normal, expected healthcare expense, whereas in Canada \$1,000 may be perceived as an amount that constitutes an overwhelming barrier.

We examined the proportion reporting having supplementary private health insurance in countries with universal publicly funded health insurance as the coordination of the two can serve as a means to reduce the amount that patients pay out-of-pocket for health services at the point of use. We found that the majority (>50% over the study period) of Canadian respondents across almost all survey years reported having supplemental private insurance. Despite the relatively limited acknowledgement of the Canadian private health insurance market (Steinbrook 2006), these findings are in line with previous assessments of private insurance coverage among populations in Canada (Allin and Hurley 2009). Interestingly, we found that relative to the UK – which has a lesser private insurance presence – the odds of having supplementary private health insurance in Canada were not significantly different than those in Australia and New Zealand, both of which cover prescription drugs and dental services through their publicly financed healthcare systems. This suggests that the paucities in the Canadian basket of publicly funded health services may not necessarily drive the extent of private insurance coverage. This extent also raises interesting issues related to equity of access. While it is difficult to assess whether the payers of the private health insurance were the respondents themselves (i.e., out-of-pocket) or their employers, it is likely to be the latter (European Observatory on Health Systems and Policies 2017). In either case, this suggests potential barriers to care for those of lower socio-economic status that may not be able to afford private health insurance premiums or whose employment does not provide such benefits.

Despite the coordination of insurance coverage schemes, the burden of added out-of-pocket expenditures can still create barriers and inequity to access in some countries. We found that out-of-pocket costs reported by Canadian respondents were comparable to those in Australia, greater than those in the UK and New Zealand, and much less than those in the US. Interestingly, in the last two years of our study period, respondents in all countries reported notable out-of-pocket expenditures (\$500–2,300) annually for their care. Considering the average household incomes among our comparator countries (OECD 2017a) (and assuming this may estimate annual household consumption), our out-of-pocket estimates are similar to the average out-of-pocket spending of 2.8% of household income consumption identified from the 2014 OECD data (OECD 2015). Such expenditures highlight the need and costs for health services that surpass that which is covered by public and private insurance means. It is difficult to determine the relative burden of differing non-insured health services, as specific expenditures were not assessed in the survey. However, reported out-of-pocket costs are likely to include prescription drugs as they were described as direct examples in this particular survey item.

Underscoring the entire discussion is the broader notion of healthcare system affordability. The concept of affordability appears to have no standardized definition. Morgan and Kennedy (2010) previously described that affordability for health technologies such as prescriptions drugs can be considered either at the level of an individual's out-of-pocket expenditures or by the overall costs incurred at the system level (Morgan and Kennedy 2010). Studies conducted specifically on the Canadian population have also correlated financial

accessibility to affordability (Campbell et al. 2014; Kennedy and Morgan 2006, 2009; Law et al. 2012). For example, using data from the Canadian Community Health Survey, previous studies have identified financial barriers to care in approximately one in ten Canadians due to reports of CRNA (Campbell et al. 2014, 2017; Law et al. 2012). Assuming that the lack of a standardized definition may reflect the complexity of the concept, we argue that selecting one interpretation over another may not be appropriate. Rather, the collective outcomes assessed in our present study could all serve as key indicators of affordability, speaking to various dimensions, including unmet needs, equity of access and impact on other consumptions.

There are limitations to this work worth noting. As with any form of self-reported survey, there is the possibility for inaccuracies in the data due to recall bias of respondents. Further, the indirect assessment of respondent out-of-pocket costs for care may have also introduced measurement bias to our findings. With the increasing use of cell phones in only the more recent years of the study period, there may be selection bias in earlier survey years with greater representation of individuals with access to landlines and stable housing. Given that the composition of respondent populations differed year to year, the generalizability of the findings to the broader respective national populations and strength of trends over time are unclear.

Financial barriers to care exist in Canada and are equal to those perceived in Australia and New Zealand, yet less than in the US. Given the intense focus on equity and reducing barriers to care in Canada, this study reaffirms that financial barriers are perceived among Canadians and may limit our ability to achieve maximum health. Intervening on CRNA, as just one example of mitigation, may improve health outcomes and potentially prevent downstream use of more costly health services (Dhalla et al. 2009; Law et al. 2012). Future work should examine effective interventions, policy redesign and system redesign learning from our peer countries to minimize financial barriers to care and reduce the financial burden on Canadians.

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Ranked Performance of Canada's Health System on the International Stage: A Scoping Review

Classement du rendement du système de santé canadien sur la scène internationale : un examen de la portée



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Abstract

Introduction: Since the release of the World Health Report in 2000, health system performance ranking studies have garnered significant health policy attention. However, this literature has produced variable results. The objective of this study was to synthesize the research and analyze the ranked performance of Canada's health system on the international stage.

Method: We conducted a scoping review exploring Canada's place in ranked health system performance among its peer Organisation for Economic Co-operation and Development countries. Arksey and O'Malley's five-stage scoping review framework was adopted, yielding 48 academic and grey literature articles. A literature extraction tool was developed to gather information on themes that emerged from the literature.

Synthesis: Although various methodologies were used to rank health system performance internationally, results generally suggested that Canada has been a middle-of-the-pack performer in overall health system performance for the last 15 years. Canada's overall rankings were 7/191, 11/24, 10/11, 10/17, "Promising" and "B" grade across different studies. According to past literature, Canada performed well in areas of efficiency, productivity, attaining health system goals, years of life lived with disability and stroke mortality. By contrast, Canada performed poorly in areas related to disability-adjusted life expectancy, potential years of life lost, obesity in adults and children, diabetes, female lung cancer and infant mortality.

Conclusion: As countries introduce health system reforms aimed at improving the health of populations, international comparisons are useful to inform cross-country learning in health and social policy. While ranking systems do have shortcomings, they can serve to shine a spotlight on Canada's health system strengths and weaknesses to better inform the health policy agenda.

Résumé

Introduction : Depuis le dépôt du Rapport sur la santé dans le monde, en 2000, les études sur la classification du rendement des systèmes de santé ont attiré l'attention politique. Cependant, cette littérature a produit des résultats variables. L'objectif de la présente étude est de synthétiser la recherche et d'analyser la classification du rendement du système de santé canadien par rapport à la scène internationale.

Méthode : Nous avons mené un examen de la portée qui explore la place du Canada dans la classification du rendement des systèmes de santé parmi les pays de l'OCDE. Le cadre d'examen en 5 étapes d'Arksey et O'Malley a été utilisé, ce qui a permis de dégager 48 articles scientifiques et de la littérature grise. Un outil d'extraction de la littérature a été développé pour obtenir de l'information sur les thèmes qui ont émergé de la littérature.

Synthèse : Bien que plusieurs méthodologies aient été employées pour classer le rendement international des systèmes de santé, les résultats suggèrent en général que le Canada se situe en milieu de peloton pour ce qui est du rendement général en santé, et ce, pour les 15 dernières années. Les classifications générales du Canada étaient 7/191, 11/24, 10/11, 10/17, « prometteur » et cote « B » selon les diverses études. La littérature antérieure indique que le rendement du Canada était bon dans les secteurs de l'efficacité, de la productivité, de l'atteinte des objectifs du système de santé, des années de vie avec un handicap et de la mortalité due à un AVC. À l'opposé, le rendement du Canada est faible dans les secteurs liés à l'espérance de vie ajustée en fonction de l'incapacité, aux années potentielles de vie perdues, à l'obésité chez les adultes et les enfants, au diabète, au cancer du poumon chez les femmes et à la mortalité infantile.

Conclusion : Alors que les pays mettent en branle des réformes des systèmes de santé qui visent l'amélioration de la santé des populations, les comparaisons internationales sont utiles pour renseigner l'apprentissage entre pays sur la santé et sur les politiques sociales. Bien que la classification des systèmes présente certaines lacunes, elle peut servir à mettre en lumière les forces et faiblesses du système de santé canadien afin de mieux informer les politiques de santé.

Introduction

Since the release of the World Health Report *Health Systems: Improving Performance* in June 2000 (WHO 2000), international studies focused on health system performance ranking have been gaining momentum. Despite challenges associated with ranking systems (Forde et al. 2013; Papanicolas et al. 2013; Smith 2002), a general enthusiasm among academic and non-academic audiences for international ranked comparisons has evolved. Studies that compare countries on the international stage provide a general and simplified picture of the overall performance of complex health systems (Hewitt and Wolfson 2013). Although what is measured may not reflect the desired end-state of a healthcare system, ranked performance sets up a contest among countries with enhanced potential to attract the media, and thus the public and the policy makers. Writing about the attention that the World Health Report garnered, Navarro (2001) compared the report to the European soccer championship, which was being held around the same time as the release of the World Health Report: "for a short period it seemed the HCS (Health Care System) league was going to be as important as the European soccer games," (p. 21). Because rankings present a simple picture of health system performance, this information tends to have broad uptake by appealing to the media and the public at large. Comparisons made between peer countries have the potential to influence health and social policy with a goal to learn lessons from the "best" performers around the world (Murray and Frenk 2010).

Among comparative studies of ranked health system performance, Canada's performance results have been variable, with some suggestion that Canada has declined in the rankings over time. The Canadian ranking for life expectancy at birth, for instance, dropped from second to seventh place in relation to 19 comparator countries between 1990 and 2010, and from fourth to tenth place for years of life lost (Murray et al. 2013). At the same time, studies have suggested that Canada has performed well, at least in certain areas. For example, according to Murray et al. (2013), Canada was shown to perform well in years of life lived with disability and stroke mortality. These variable results have left many with a confusing picture of Canada's overall health system performance on the international stage. To address these disparate and somewhat contradictory findings, the objective of this scoping review was twofold: (1) to synthesize the existing literature on health system performance and rankings, and (2) to examine and summarize Canada's ranked health system performance to provide a clear picture of Canada's performance that can offer insights for policy makers and the public at large.

Methodology

We adopted the five-stage scoping review framework developed by Arksey and O'Malley (2005): identifying the research question; identifying the relevant studies; defining inclusion and exclusion; charting the data; and collating, summarizing and reporting the results. Arksey and O'Malley (2005) define a scoping review as "a technique to 'map' relevant literature in the field of interest ... [which] tends to address broader topics where many different study designs might be applicable ... [and] is less likely to seek to address very specific research questions nor, consequently, to assess the quality of included studies." (Arksey and O'Malley 2005: p. 20)

Two reviewers (M.N. and T.S.) initiated the review with the question "What do we know about Canada's health system performance in the international context?" Initially, all MeSH (Medical Sub Headings) and keywords related to health system performance (Box 1) were identified and a search was conducted using various sources. The first reviewer (M.N.) searched online databases Medline, Scopus, CINAHL and Embase. The second reviewer (T.S.) searched Google scholar and websites of the World Health Organization (WHO), the Organisation for Economic Co-operation and Development (OECD), the Canadian Institute for Health Information (CIHI), the Conference Board of Canada and the Commonwealth Fund for grey literature.

BOX 1. Search terms

- Health system performance OR
- Health system ranking OR
- Healthcare performance OR
- Healthcare ranking OR
- Performance measurement OR
- AND
- Developed countries OR
- Canada

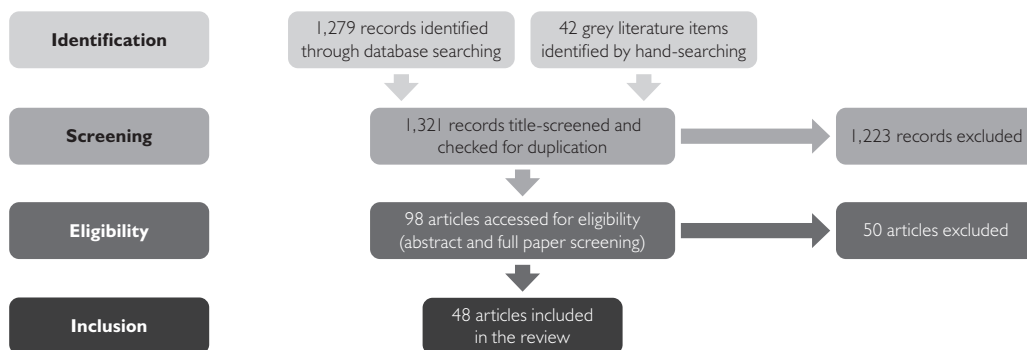
Our search terms and sources were broad enough to capture all types of study designs. The search process was iterative. As familiarity with the literature increased, the search terms and sources were redefined to allow more precise searches to be undertaken. The initial literature review increased familiarity with the concept and helped us systematically develop the inclusion and exclusion criteria (Table 1). Although definitions of "performance" were variable within the literature, we defined health system performance as "the capacity of a system to produce the highest attainable or most desirable outcome for indicators, while indicators measured one or many aspects of the health system" (Tchouaket et al. 2012). The two reviewers independently selected articles that ranked health systems based on their performance or that generally discussed ranking health system performance. Papers that did not rank health systems or studies that narrowly focused on subcomponents of health system performance such as efficiency, productivity, effectiveness, quality, accessibility, utilization and equity were excluded from the study. Our exclusion criteria were applied systematically to the best of our knowledge and the included papers represented the span of studies a scoping review usually captures.

TABLE 1. Inclusion and exclusion criteria for the papers

Inclusion criteria	Exclusion criteria
Ranked health system performance	Specifically focused on quality, efficiency, equity or accessibility, without linking them to performance
Generally about ranking health system performance	Not in English
Published in English between 2000 and 2015	Published before 2000 and after 2015
Focused on international health system performance rather than provincial	Compared only Canadian provinces and territories

The initial search yielded more than 1,000 sources. We performed a three-part selection process. Initially, the titles were reviewed independently by two reviewers (M.N., T.S.) to verify that each paper met the established inclusion and exclusion criteria. Then, the two independent reviewers screened the abstracts and full papers to include sources. The reviewers exchanged their list of sources to ensure shared understanding of the inclusion/exclusion criteria. Finally, a third reviewer (K.H.) examined the selections of the first two reviewers. Any uncertainty was followed up with discussion amongst the three reviewers to reach a consensus. The inclusion and exclusion criteria resulted in 48 retained sources (Figure 1). The literature was imported into the software program Ref Manager.

FIGURE 1. Flow chart



The two reviewers applied a qualitative approach using open coding and inductive reasoning to identify themes in the literature and to develop categories for further coding and sorting. The third reviewer observed the coding to ensure inter-reviewer reliability. The reviewers subsequently agreed on major themes and developed a literature extraction tool to obtain key information from the academic and grey literature. The data were extracted and were inputted directly into the literature extraction tool on an Excel spreadsheet. The extracted data were a mixture of general information about the studies, specific information relating to health system performance methodology and Canada’s health system performance. Empirical studies that included Canada were distinguished and charted in a separate table to provide in-depth information on Canada’s ranked performance. We synthesized

the extracted data and produced a preliminary findings report which was shared with the team and with an external expert panel for further comments. The research team members brought to the table a range of expertise in national and international health policy analysis, population health and health system performance. For the external panel, this project drew together national and international scholars in the fields of epidemiology, biostatistics, public health, international health policy, and clinical medicine. Comments from the team members and the external advisors were integrated, and a final summary of the synthesized findings was produced.

Synthesis

The 48 sources in this review included academic and grey literature, empirical and conceptual papers, commentaries and editorials. Appendix 1 (available at: <http://www.longwoods.com/content/25191>) provides basic information on the 48 sources. Grey literature mainly came from the WHO, the Commonwealth Fund, the Conference Board of Canada, the OECD and the CIHI – organizations that maintain and report on national and international health-related databases. The time period of the performance data ranged from 1960 to 2010. Of the 48 sources included, the reviewers distinguished 12 empirical studies that explicitly ranked Canada on the international stage, and those 12 studies were charted separately in Table 2 and Appendix 2 (available at: <http://www.longwoods.com/content/25191>) for in-depth synthesis of Canada's ranked performance. On average, a three- to five-year interval existed between the time data were collected and the time a study was published using the same data.

The set of comparator countries varied across studies. For example, the original WHO World Health Report (2000) included 190 countries while other studies elected to assess a more narrowed set of OECD countries or "peer countries" (Table 2). Given that the comparator countries had noteworthy influence on rankings, some have argued that ranking performance among peer countries was a more plausible and appropriate pursuit compared to the indiscriminate inclusion of all countries in the original list. However, regardless of countries selected, in most studies peer countries were selected implicitly without establishing any clearly defined criteria. When criteria were explicitly specified, they most often included factors such as GDP per capita, population size, language, culture and history. One paper developed a model based on health outcome indicators and country characteristics to identify clusters of peer countries (Bauer and Ameringer 2010).

Major themes were categorized around health system performance methodologies and Canada's ranked health system performance. It is worth noting that even the health system performance methodologies identified in this review were generally related to Canadian context due to the bias for Canada in the inclusion and exclusion criteria. If there were other methodologies that did not include Canada in their ranking, they were excluded from this review.

Ranked Performance of Canada's Health System on the International Stage: A Scoping Review

TABLE 2. A summary of methodologies for ranked performance and Canada's ranking

Author (year)	Title	No.	HSP methodology	HSP measurement indicators	Canada's overall/ranked performance
WHO (2000)	<i>The World Health Report 2000 – Health Systems: Improving Performance</i>	191	A composite of indicators as a measure of HSP: focused on objectives of the HS	Health status: DALE Responsiveness: Survey Fairness: Survey	<ul style="list-style-type: none"> Overall goal attainment: 7/191 Overall performance: 30/191
Anderson and Hussey (2001)	<i>Comparing Health System Performance in OECD Countries</i>	26	Individual indicators as a measure of HSP on key subject areas	Individual indicators: (1) Immunization rate, smoking and alcohol consumption (2) Physicians and hospitals (3) MRI per million, coronary bypass and dialysis per 100,000 (4) DALE and PYLL (5) WHR Responsiveness (6) Health spending per capita and percentage of GDP	Compared to OECD median, Canada has: <ul style="list-style-type: none"> a lower immunization rate higher smoking and lower alcohol consumption higher physician visit per capita lower MRI and higher coronary bypass and dialysis higher DALE and LE lower PYLL higher spending
Nolte et al. (2006)	<i>Diabetes as a Tracer Condition in International Benchmarking of Health Systems</i>	29	Disease as a tracer condition to assess HSP	Diabetes incidence and mortality	Diabetes mortality to incidence ratio: 6/29
The Conference Board of Canada (2006)	<i>Healthy Provinces, Healthy Canadians: A Provincial Benchmarking Report</i>	24	A composite of indicators as a measure of HSP: benchmarking all indicators together	Health status: 11 indicators Healthcare outcomes: 7 indicators Healthcare utilization: 1 indicator	Overall ranking: 11/24
Gay et al. (2011)	<i>Mortality Amenable to Healthcare in 31 OECD Countries: Estimates and Methodological Issues</i>	31	Mortality amenable to healthcare intervention	Amenable mortality	<ul style="list-style-type: none"> Nolte and McKee: 11/31 (male = 9; female = 12) Tobias and Yeh: 15/31 (male = 11; female = 16)
Tchouaket et al. (2012)	<i>HSP of 27 OECD Countries</i>	27	A composite of indicators as a measure of HSP: Donabedian's structure-process-outcome and effectiveness, efficiency and productivity	Health status: 27 indicators Resources: 21 indicators Health services: 20 indicators	<ul style="list-style-type: none"> Absolute performance (below average, average or above average): average Relative performance (below average, average or above average): above average Integrated overall performance (limited, weakly polarized, promising or satisfactory): promising
Verguet and Jamison (2013)	<i>Performance in Rate of Decline of Adult Mortality in the OECD, 1970–2010</i>	22	Individual indicator as a measure of HSP: adult mortality	Female adult mortality	Ranking based on FAM: <ul style="list-style-type: none"> 1971–1980 = 15/22 1981–1990 = 7/22 1991–2000 = 15/22 2001–2010 = 15/22 Ranking based rate of decline: <ul style="list-style-type: none"> from 1971–1980 to 1981–1990 = 6/22 from 1981–1990 to 1991–2000 = 17/22 from 1991–2000 to 2001–2010 = 13/22

TABLE 2. Continued

Author (year)	Title	No.	HSP methodology	HSP measurement indicators	Canada's overall/ranked performance
Veillard et al. (2013), CIHI (2011, 2013)	<i>Methods to Stimulate National and Sub-National Benchmarking through International Health System Performance Comparisons: A Canadian Approach</i>	34	Individual indicators as measures of HSP: directional measures for four dimensions of HSP: (1) Health status, (2) Non-medical determinant, (3) Access and (4) Quality of care	Health status: 15 indicators Non-medical determinant: 6 indicators Access: 3 indicators Quality of care: 15 indicators	Compared to OECD average, Canada performs well on some indicators and needs improvement on others
Murray et al. (2013)	<i>UK Health Performance: Findings of the Global Burden of Disease Study 2010</i>	19	Individual indicator as a measure of HSP: benchmarking individual indicators	Mortalities and causes of death, YLL, YLD, DALY, HALE (259 diseases and injuries and 67 risk factors)	<ul style="list-style-type: none"> Age-standardized YLLs: 1990 = 4/19; 2010 = 10/19 LEB: 1990 = 2/19; 2010 = 7/19 Health-adjusted LEB: 1990 = 2/19; 2010 = 5/19
Gerring et al. (2013)	<i>Assessing Health System Performance: A Model-Based Approach</i>	190	Composite index: economy–education, epidemiology, geography, culture and residual is modelled as public health index in which residual is considered as HSP	Health outcome: 9 indicators Culture and history: 2 indicators Education: 2 indicators Epidemiology: 3 indicators Geography: 11 indicators Economy: 3 indicators Miscellaneous: 8 indicators	Canada's overall ranking: 97/190
Davis et al. (2014)	<i>Mirror, Mirror on the Wall</i>	11	Composite: ranking based in individual indicators and averaging the ranks	Quality: 44 indicators Access: 12 indicators Efficiency: 11 indicators Equity: 10 indicators Healthy lives: 3 indicators	Canada's overall ranking: 10/11
The Conference Board of Canada (2015)	<i>International Ranking: Canada Benchmarked Against 15 Countries</i>	17	Composite: normalizing and averaging indicators	11 indicators: LEB; self-reported health status; premature mortality (PYLL); infant mortality; mortality from cancer; circulatory disease, respiratory disease, diabetes, musculoskeletal system, mental disorders and medical misadventures	Canada's overall grade: "B" Canada's overall ranking: 10/17

CIHI = Canadian Institute for Health Information; DALE = disability-adjusted LE; DALY = disability-adjusted life year; FAM = female adult mortality; GDP = gross domestic product; HALE = health-adjusted LE; HS = health system; HSP = HS performance; LE = life expectancy; LEB = LE at birth; MRI = magnetic resonance imaging; No. = number of countries compared; OECD = Organisation for Economic Co-operation and Development; PYLL = potential YLL; WHO = World Health Organization; WHR = World Health Report; YLD = years lived with disability; YLL = years of life lost.

Health system performance methodology

Of the 48 sources included in this review, 12 used some method of ranking and included Canada among the countries ranked (Table 2). Each of the studies applied different frameworks, indicators and analytical methods. The four main groups of indicators included population health outcome indicators, disease-specific indicators, healthcare system indicators and indicators focused on the non-medical determinants of health. Population health outcome indicators (i.e., life expectancies, years of life lost and mortalities) were found in nearly all studies (Anderson and Hussey 2001; Davis et al. 2014; Gerring et al. 2013; Heijink et al. 2013; Murray et al. 2013; Nolte et al. 2006; Reibling 2013; Tchouaket et al. 2012;

The Conference Board of Canada 2006, 2015; Veillard et al. 2013; Verguet and Jamison 2013; WHO 2000). Some studies went beyond outcome indicators and included causes of death, disease incidence rates and mortality rates for specific diseases (Arah et al. 2005; Murray et al. 2013; Nolte et al. 2006; The Conference Board of Canada 2015). Healthcare system indicators typically comprised the number of physicians and hospitals, the volume of services and utilization rates. Indicators of health spending were also used to assess efficiency, fair financing and equity of access within the health system (Davis et al. 2014; Heijink et al. 2013; Reibling 2013; Tchouaket et al. 2012). Non-medical determinant indicators were generally related to smoking, alcohol and diet (Anderson and Hussey 2001; Hussey et al. 2004; The Conference Board of Canada 2006).

Numerous analytical methods were applied in ranking health system performance. Simple benchmarking approaches were the most common, in which a country's performance was ranked in relation to top and bottom performers (Davis et al. 2014; Tchouaket et al. 2012; The Conference Board of Canada 2006, 2015). Some studies used more complex methods to assess the performance of countries. One study applied cluster analysis to group countries with same level of performance (Tchouaket et al. 2012), and another applied a least squares regression model to control for broader social determinants of health such as education, economy and history and culture (Gerring et al. 2013). The choice of analytical methods depended on the conceptual framework used to assess health system performance.

The methodologies applied to assess health system performance fell into one of two categories: those that used a single health indicator as a proxy for health system performance, and those that developed an index for health system performance using many indicators. When single indicators were taken as a measure for health system performance, population health outcome indicators were the most commonly used (Murray et al. 2013; Verguet and Jamison 2013). The second category of studies used a number of indicators to create a single composite index for health system performance. Composite indices were created in multiple ways. The simplest approach was to sum indicators normalized along the same scale (Davis et al. 2014). Another approach combined indicators weighted according to theoretical or conceptual frameworks (Tchouaket et al. 2012; WHO 2000).

Caution was taken when interpreting findings, as all methods of ranking had limitations. For example, the method that used summary health indicators as a proxy for health system performance was criticized on the grounds that health was a function of the whole of society rather than just the health (care) system, and that health outcomes could not be attributed only to the activities of the health system (Arah et al. 2006; Handler et al. 2001; Kaltenthaler et al. 2004; Navarro 2001; Rosen 2001). Studies that simply added up indicators by giving them equal weight were also consistently criticized (Richardson et al. 2003; Wibulpolprasert and Tangcharoensathien 2001). The use of conceptual frameworks in performance assessment was generally applauded for acknowledging the complexity of health systems, but the way each framework was operationalized was often heavily criticized (Bhargava 2001;

Blendon et al. 2001; Deber 2004; Mulligan et al. 2000; Wagstaff 2002; Wibulpolprasert and Tangcharoensathien 2001). For example, the chief editor of the 2000 WHO report, Musgrove (2010) wrote 10 years after the report was published that “61% of the numbers that went into that ranking exercise were not observed but simply imputed” (p. 1546).

Canada’s ranked health system performance

Canada’s ranked performance varied across the studies. Table 2 and Appendix 2 summarize Canada’s ranked health system performance in the 12 empirical studies. When ranked in numbers, Canada’s performance ranged from 6/29 for diabetes mortality-to-incidence ratio (Nolte et al. 2006) to 97/190 for overall health system performance (WHO 2000). Table 3 shows Canada’s ranked numbers in various studies, with each study applying different indicators, different frameworks, different comparator countries and different analytical methods.

TABLE 3. Summary of Canada's ranked performance in numbers

Year	Author	Ranked for	Canada's ranking
2000	WHO	Overall goal attainment	7/191
2000	WHO	Overall health system performance	30/191
2006	Nolte et al.	Diabetes mortality to incidence ratio	6/29
2006	The Conference Board of Canada	Overall health system performance	11/24
2013	Verguet and Jamison	Female adult mortality	15/22
2013	Murray et al.	Age-standardized years of life lost	10/19
2013	Murray et al.	Life expectancy at birth	7/19
2013	Gerring et al.	Overall health system performance	97/190
2014	Davis et al.	Overall health system performance	10/11
2015	The Conference Board of Canada	Overall health system performance	10/17 (B grade)

WHO = World Health Organization.

When not ranked in numbers, Canada was often compared to the OECD average. In these cases, Canada tended to achieve a middling performance (Anderson and Hussey 2001; Veillard et al. 2013) in terms of absolute performance, “above average” for relative performance and “promising” for “integrated overall performance” (Tchouaket et al. 2012).

Overall, we identified a number of themes regarding Canada’s ranked performance. First, Canada performed well for some indicators and poorly for others. When analyzed further, it was found that Canada’s rankings were higher for most population health outcome indicators but lower for complex indices of performance. Second, there was a sex difference in Canada’s ranking in the international stage, with some indicators of female health ranking lower than indicators of male health. Finally, Canada’s ranked performance tended to decline over time. In earlier decades, Canada’s ranked performance tended to be stronger, but a fall through the ranks is observable in more recent decades.

Canada's performance was variable depending upon the indicators selected. Some of the desirable rankings included Canada being placed 7th out of 191 countries in terms of overall goal attainment (WHO 2000). Canada's male life expectancy was 6/24 in 2006, male disability adjusted life expectancy (DALE) was 5/26 in 2001 and male potential years of life lost (PYLL) was 6/26 in 2001 (Anderson and Hussey 2001). Canada was found to be a top performer in terms of stroke care for years (Murray et al. 2013; The Conference Board of Canada 2006). Tchouaket et al. (2012) clustered Canada into a group of countries with higher levels of service, higher efficiency (outcome/resource) and higher productivity (services/resources). In terms of undesirable performances, Canada ranked 14th out of 26 countries for female DALE and 12th out of 26 countries for female PYLL in 2011 (Anderson and Hussey 2001). Canada ranked second last for female lung cancer rate and third last for female mortality from lung cancer (The Conference Board of Canada 2006). In 2013, Canada ranked 15th out of 22 countries for female adult mortality (Verguet and Jamison 2013). Veillard and colleagues found Canada had higher rates of overweight and obesity in adults and children, and higher rates of diabetes in adults compared to OECD average in 2013 (Veillard et al. 2013). The Conference Board of Canada gave Canada a "C" grade for infant mortality (The Conference Board of Canada 2015). Tchouaket and colleagues (2012) grouped Canada among countries with poorer resources, average outcomes and lower effectiveness (meaning the outcome was not to the level expected of the amount of services provided).

Despite the variability within the literature, Canada often ranked higher for summary population health outcome indicators compared to composite indices. In the 2000 WHO report, Canada ranked 12/191 for health status, which dropped to 30/191 for the overall health performance index (WHO 2000). In 2010, Canada's ranking for health-adjusted life-expectancy at birth was 5/19 and for age-standard years of life lost 10/19 (Murray et al. 2013). Around the same time, Canada ranked 10/11 for a composite index developed by the Commonwealth Fund combining 80 indicators (Davis et al. 2014), 10/17 for another composite index developed by The Conference Board of Canada combining 11 indicators (The Conference Board of Canada 2015) and 97/190 for a composite index of health system performance controlling for social determinants of health (Gerring et al. 2013).

Canada's rankings also had a sex dimension. Canada's ranking for female indicators of health were generally lower compared to its ranking for male indicators of health. For example, Canada's ranking for male DALE was 5/26, while for female DALE, it was 14/26; Canada's male PYLL was 6/26, while Canada's female PYLL was 12/26 (Anderson and Hussey 2001). The Conference Board of Canada (2006) found Canada second last for female lung cancer rate, and third last for female mortality from lung cancer.

Finally, in studies that tracked Canada's performance over time, there was a general trend of decline through the rankings. Canada's ranking for age-standard years of life lost has dropped from 4/19 in the 1990s to 10/19 in 2010, and for life expectancy at birth from 2/19 in the 1990s to 7/19 in 2010 (Murray et al. 2013). The Conference Board of Canada ranked Canada's overall health system performance at 11/24 in 2004, which dropped to 10/17 in 2015 – a three-rank drop if they were put in a same scale (The Conference Board of Canada 2006, 2015).

Discussion and conclusion

When analyzing ranking studies, Hewitt and Wolfson (2013) urged the research community to carefully consider the aspects of health or healthcare being assessed; the relationship between indicators within the health system, as well as the reliability, accuracy and comparability of indicators, and the methods of ranking and analysis. As important as it is to note that not everything measured is necessarily valuable, synthesizing what is already measured can be useful. Our findings indicated that the heterogeneity in methodologies to assess ranked health system performance has led to the development of a diverse literature focused on different aspects of health system performance, yielding variable results. Some studies used simplistic methods of selecting one indicator as a proxy for health system performance, while others applied more intricate methods to create composite indices of health system performance. Despite the heterogeneity in methodologies, a growing literature on health system performance ranking suggests that the systematic compilation of results has the potential to add value by creating an overall picture of performance which can offer insight for policy makers in Canada as well as the public at large.

The time lag between data collection and research publication indicates that published research and analyses are not reflective of the current (the time of publication) performance of health systems. The consideration of time lag becomes more important when combined with political cycles of government and corresponding healthcare priorities and the lag effect of policies, as it often takes years before the impact of policy becomes evident on health at the population level. In today's world, the growing prevalence of timely data requires analytical tools to translate data into actionable knowledge promptly.

In terms of country rankings, it is not surprising to see Canada rank higher for some indicators and lower for others, but unpacking the themes around higher and lower rankings provides further insights. Canada's lower ranking is typically observed when a composite index is used to rank health system performance. For major population health outcome indicators, Canada tends to perform well. However, further research is required to understand the reason for Canada's declining ranking among studies that use composite indices. A decline in ranking has been observed over the last two decades, but it is important to note that this decline over time does not mean that Canada's performance has worsened (Nolte and McKee 2011). In terms of absolute numbers, for example, Canada's life expectancy improved from 77.2 in 1990 to 80.6 in 2010 (Murray et al. 2013). It is other countries that are improving at a higher pace than Canada. The slow improvement rate was found in one study in which Canada ranked 138 out of 191 countries for improvement rate between 1960 and 2010 (Gerring et al. 2013). A sex difference in Canada's ranking observed in various studies may be partially explained by poor performance of Canada's female indicators for lung cancer, evident from multiple studies included in this review.

Conclusions about Canada's middling performance must be interpreted carefully. Canada's middling performance is usually concluded as a result of Canada performing well on some indicators and poorly on others. But middle-of-the-pack performance is a relative assessment. It does not convey a sense of Canada's absolute performance. In a report by the Canadian

Institute for Health Information (CIHI 2016), this interpretation challenge is discussed in further detail. By ranking countries' performances, the absolute distance between the first and the second positions may not be the same as the absolute distance between the second and the third performing countries. Thus, a middling performance does not convey much about the absolute performance of the country but only its relative performance according to the set of comparator countries included in the analysis. It is worth noting that countries that are improving at a faster pace than Canada are aiming to be the best in the world. One of Canada's common peer countries, Australia, has been striving to match the best performers in the world, and in some cases appears to be improving at a higher rate than Canada (Ring and O'Brien 2008).

Our study had a number of limitations. We have missed some relevant sources because of the databases we included; time constraint between 2000 and 2015; exclusion of studies published in languages other than English; a specific focus on Canada and bias from our definition of performance that omits narrow aspects of performance such as equity, efficiency, effectiveness, quality, productivity, accessibility and utilization. Furthermore, it was an intentional decision on the part of the reviewers to focus on specific rather than broad. Therefore, this is not a comprehensive review of literature on health system performance, but an in-depth synthesis of literature on the ranking of health system performance. Although not comprehensive, we observed that the studies included were representative and reflected the patterns and trends in the literature. It is possible that our findings could have been influenced by particular expertise of the members of the team; however, we worked with an external expert panel to minimize that possibility. Unlike systematic reviews, scoping reviews often lack critical appraisal of the sources they include. Though we did not perform a systematic quality appraisal to include sources, we have distinguished empirical studies among the included sources.

In conclusion, ranking health systems based on the heterogeneity of frameworks, methodologies and indicators has three implications for policy. First, countries' rankings change in different studies. It should not be a cause for hasty media attention or policy decisions. Second, rankings are often reflective of certain aspects of health systems. Depending on what is being ranked, it is better that policy debates focus on specific aspects of a health system rather than the whole of the health system. Third, it is not the rank that offers the lesson, but what has been ranked and how. Ranking may be a good way to attract media and raise public awareness about aspects of the health system, but it has limited potential to offer valuable lessons for policy makers, health managers and frontline program implementers. Future research on international health system performance should move from studies that simply present rankings to studies that explore best practices within countries to facilitate cross-learning at the global level.

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Exploring Context and the Factors Shaping Team-Based Primary Healthcare Policies in Three Canadian Provinces: A Comparative Analysis

Explorer le contexte et les facteurs qui façonnent les
politiques des équipes de soins primaires dans trois
provinces canadiennes : une analyse comparative



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Exploring Context and the Factors Shaping Team-Based Primary Healthcare Policies

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Abstract

This paper discusses findings from a high-level scan of the contextual factors and actors that influenced policies on team-based primary healthcare in three Canadian provinces: British Columbia, Alberta and Saskatchewan. The team searched diverse sources (e.g., news reports, press releases, discussion papers) for contextual information relevant to primary healthcare teams. We also conducted qualitative interviews with key health system informants from the three provinces. Data from documents and interviews were analyzed qualitatively using thematic analysis. We then wrote narrative summaries highlighting pivotal policy and local system events and the influence of actors and context. Our overall findings highlight the value of reviewing the context, relationships and power dynamics, which come together and create “policy windows” at different points in time. We observed physician-centric policy processes with some recent moves to rebalance power and be inclusive of other actors and perspectives. The context review also highlighted the significant influence of changes in political leadership and prioritization in driving policies on team-based care. While this existed in different degrees in the three provinces, the push and pull of political and professional power dynamics shaped Canadian provincial policies governing team-based care. If we are to move team-based primary healthcare forward in Canada, the provinces need to review the external factors and the complex set of relationships and trade-offs that underscore the policy process.

Résumé

Cet article aborde les résultats d'un examen poussé des facteurs contextuels et des acteurs qui influencent les politiques des équipes de soins primaires dans trois provinces canadiennes : la Colombie-Britannique, l'Alberta et la Saskatchewan. L'équipe a étudié plusieurs sources (p. ex., les informations de presse, les communiqués de presse et les documents de travail) pour obtenir de l'information contextuelle pertinente sur les équipes de soins primaires. Nous avons aussi mené des entrevues qualitatives auprès d'informateurs clés des systèmes de santé des trois provinces. Les données provenant des documents et des entrevues ont été analysées qualitativement au moyen d'une analyse thématique. Nous avons ensuite rédigé des résumés qui soulignaient les politiques clés et les événements locaux des systèmes ainsi que l'influence des acteurs et du contexte. Nos conclusions générales soulignent la valeur de la revue du contexte, des relations et des dynamiques de pouvoir, qui s'unissent pour créer des « fenêtres politiques » à divers moments. Nous avons observé des processus politiques centrés sur les médecins dans certaines initiatives récentes visant à rééquilibrer le pouvoir et à être plus inclusives face aux autres acteurs et points de vue. La revue du contexte a aussi permis de souligner l'influence des changements dans le

leadership politique et la priorisation des forces politiques pour les équipes de soins. Bien que cela soit présent à divers degrés dans les trois provinces, les forces politiques et les dynamiques de pouvoir donnent forme aux politiques provinciales canadiennes qui gouvernent les équipes de soins. Si l'on souhaite l'avancement des équipes de soins primaires au Canada, les provinces doivent réviser les facteurs externes et l'ensemble complexe de relations et de compromis qui sous-tendent les processus politiques.

Introduction

Over a decade ago, Canada's First Ministers agreed to make team-based care a central component of healthcare reform. In 2003, they agreed to ensure that Canadians will receive care from multidisciplinary primary healthcare organizations or teams (Health Council of Canada 2005). Teams were defined in the reforms as two or more healthcare providers providing services in a coordinated and integrated manner for the patient's basic healthcare (Health Council of Canada 2009). Substantial resources, via the Primary Care Transition Fund, were allocated to projects piloting multidisciplinary, team-based models of primary care (Herbert 2005; Watson and Wong 2005). These initiatives recognized the potential of creating primary care teams to work together and better address the needs of primary care populations with chronic, complex health conditions.

The growing evidence base suggests that multidisciplinary teams improve care quality and outcomes for patients with complex care needs, job satisfaction among healthcare providers and can improve co-ordination of care and reduce costs (Harris et al. 2016). However, despite Canada's early enthusiasm and investments, team-based primary healthcare was not widely implemented. Instead, team-based primary care remains a patchwork of local reforms and pilot studies (Aggarwal and Hutchison 2012; Hutchison 2008; Levesque et al. 2012).

In Canada, the provinces and territories have jurisdiction over health policy development and implementation, and this includes primary healthcare services. In Canada, team-based care operates under the 1984 *Canada Health Act*, which stipulates that provinces pay for hospital and physician services in return for transfer payments for health services (Deber et al. 2010; Marchildon 2013). The services of many non-physician out-patient healthcare providers (e.g., chiropractors) may be funded or subsidized by the provinces whereby physician private practices for medically necessary care are required to be funded through public funds. Thus, the composition of the "team" and how different members are funded depends on provincial/territorial prioritization. Consequently, different definitions and configurations of team-based primary care have emerged across provincial policies and have varying degrees of successful implementation (Zygmunt and Berge 2014). Given even these high-level issues, the reality is that choices on implementing teams-based services are made within a context of available resources, health human resource capacity and distribution, professional power dynamics, payment models, demographics, geography and the demands and health needs of the public.

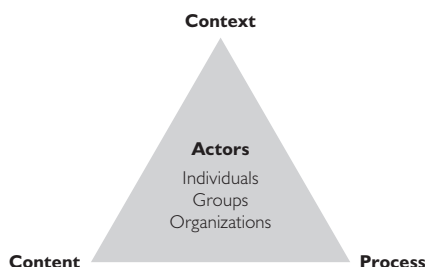
It is therefore reasonable to assume that differences in approach and progress in team-based care have arisen because of differences in provincial context. What we do not know is which elements of context have an important influence on policy development. To support the development of policy options to move team-based care forward, a better understanding of the dynamics between local actors and local policy history is important.

To this end, we conducted a case-study review of policy evolution in three western Canadian provinces – Alberta, British Columbia and Saskatchewan. We aimed to identify and review diverse evidence on the people and events shaping team-based primary health-care alongside formal policies produced and implemented in a particular time period. In this paper, we present the findings from the provincial context reviews and the interviews with key informants about the potential drivers of policy on team-based primary healthcare services. While policy is often the product of complex pressures and myriad influences (see the full report Suter et al. 2014), the focus on actors and context is relatively novel as part of traditional policy analysis and has implications for future cross-provincial policy development initiatives.

Methods

There are several conceptual frameworks for conducting research on policy but for this study we selected the policy triangle framework (Walt and Gilson 1994). The framework (Figure 1) incorporates an analysis of actors and the social, political, economic and cultural contexts in which policy is created (Walt and Gilson 1994).

FIGURE 1. Policy triangle



Source: Walt and Gilson (1994).

Our research was primarily a comparative policy analysis and our key aim was to review and compare existing policy documents in different places. However, our interest in reviewing policies in the light of broader information about the policy landscape in which they had evolved meant we needed to be selective about our study sites. For this reason, we used a case-study approach. Case studies can provide a rich understanding of social phenomena within their own context (Yin 2011). They have been shown to be particularly useful in understanding the factors that shape health policy (Crowe et al. 2010; Gilson 2012). We chose the three Western Canadian provinces – British Columbia, Alberta and Saskatchewan – because they have important differences in how they organize and deliver primary healthcare and their strategic plans.

Using the policy triangle framework, we aimed to compare the policies, considering the context in which they developed and highlight common and divergent themes (Suter et al. 2014). It encouraged us to look beyond the policies themselves and consider underlying relationships and power dynamics (Suter et al. 2014).

To support the work and ensure its relevance to policy makers in the provinces, an advisory team comprising knowledge users and academic researchers was established (Suter et al. 2014). The research and knowledge users who advised us represented a range of perspectives including academics, private consultants, provincial Ministries of Health, health regions and professional organizations. The advisory committee had equitable representation from the three provinces.

The advisory team met with the core research team every one to two months to offer advice on several aspects of the research project including the parameters for the context review, for instance, news stories and documents, the search strategy and our analytical templates. The core research team, who were responsible for data collection and analysis, comprised five researchers from Alberta Health Services (Suter et al. 2014).

Document Review

The members of our advisory team recommended a high-level scan of *Health Edition* (no longer operating), which was a news repository on key health issues from across Canada. We systematically searched the website to identify the social, political and economic dimensions such as political leadership and strategic direction, financial and non-financial resource availability, demographic shifts and professional lobbying that influenced primary healthcare service delivery in the three provinces. We focused our searches on information from 2007 to 2014 to limit the data collection. However, key events that occurred earlier but have impact that extend into our time frame were included – thus enlarging our time frame to 2000. Our inclusion criteria also included documents that were written in English and had a substantial focus on the strategies for primary healthcare reform in Alberta, British Columbia and Saskatchewan and/or the contextual factors that drove policy development (e.g., politics). Any documents identified in the scan (e.g., review papers/briefings, sections from relevant policy documents, peer-reviewed journal articles, media articles, book chapters, editorials and opinion pieces) were also included in our analysis.

We created and used an appraisal tool to judge the relevancy of the documents, the type of document, the focus of the document, the main message and the setting of the document. One researcher filled in the appraisal tool and another researcher validated it. If there was agreement between the researchers, the document was included in the case study review. Any disagreements about the inclusion of documents were resolved at team meetings.

We developed an analytical template to extract and summarize the relevant information on the contextual factors and the role of key actors that set the direction of policy on team-based primary healthcare. Sub-sections of the template included the following: politics, society and culture, economic, service delivery and health profession relationships and values

(Suter et al. 2014). One researcher extracted the information and a second researcher verified the accuracy of the information within the subsection. We settled any disagreements through team meetings. In all, we retrieved 176 news items and source documents (Table 1). We deemed only 119 of these to be relevant to our study. We used these news items and source documents to write succinct two-page narratives of the policy landscapes in each of the three provinces that included a timeline and description of key provincial policies, events and key actors.

TABLE 1. News items captured and screened for relevancy

Province	Number of news items retrieved	Number of news items deemed relevant
British Columbia	41	30
Alberta	85	52
Saskatchewan	50	37
Total	176	119

Key informant interviews

With the help of our advisory team, we identified a purposive sample of key informants who had intimate knowledge of the policy landscape for team-based primary healthcare in their own province. They were invited to participate by e-mail. We sent them participant information, consent forms and the narrative summary of the policy context for their province.

In all, we conducted 30 telephone key informant interviews with provincial stakeholders (Alberta $n = 10$, British Columbia $n = 9$, Saskatchewan $n = 11$). The primary affiliation of the key informants is as follows: Ministries or Departments of Health ($n = 5$), professional colleges or associations ($n = 5$), primary care services ($n = 4$), universities ($n = 5$) and health regions ($n = 8$). Two of the key informants were private healthcare consultants. All of the key informants from the provincial Ministries and Departments of Health, regional health authorities, primary healthcare organizations and provincial professional associations had senior positions within their organizations (e.g., director, registrar, medical director, executive director, president). Although they had primary affiliation with an organization or health region, several ($n = 5$) of the key informants were also practising family physicians. One key informant was also a practising nurse practitioner.

Using the narrative summaries of the policy landscape we had written and an open-ended topic guide, we asked the key informants to consider contextual factors and the key actors influencing primary healthcare policy within their respective provinces. The interviews took approximately 30 minutes to one hour to complete. They were questioned about the direction being taken in their province on team-based primary healthcare including the key drivers and the key actors. The goal was to elicit a more in-depth and enriched account of policy development. We recorded and transcribed the interviews verbatim and then conducted a thematic analysis. This involved an initial reading and independent marking of a sample of transcripts, a discussion within the team to agree to key themes and finally the construction of thematic

tables to summarize relevant data from each interview (Ritchie and Lewis 2003). The final thematic tables included *a priori* themes (e.g., resource availability, key actors, demographics, political leadership) and themes that had emerged from the interviews. Two researchers were responsible for analyzing each province. One team member was responsible for analyzing transcripts in each province and entering data into an analytical template. The second team member also read through the transcripts and checked and validated their thematic analysis summary. Team members were available for discussion of any queries about analysis and any disagreements of interpretation were resolved through team discussion.

We revised our provincial narratives based on the in-depth information provided by the key informants. We also sent the key informants the final analytical paper for their review and validation. The details on our analytical templates are available in our full report (Suter et al. 2013).

Ethics

We obtained ethics approval from the University of Calgary Conjoint Health Research Ethics Board, the University of British Columbia Behavioural Research Ethics Board and the Universities of Regina and Saskatchewan Ethics Boards. We gained operations approval from the different participating health authorities.

Results

Improving access to appropriate care providers, enabling the effective use of available resources and supporting patients with managing their chronic disease is embedded in the primary healthcare policies of all three provinces (Alberta Health 2014; British Columbia Ministry of Health 2007; Saskatchewan Ministry of Health 2012). These principles, while incorporated into provincial policies (Suter et al. 2014), did not necessarily translate into the full spread of team-based care within the provinces. The following narratives for British Columbia, Alberta and Saskatchewan outline several potential explanations for this apparent disconnect between policy intent and practice (see Table 2 on page 87 for a summary). Timelines for these events can be found in our report (Suter et al. 2014).

British Columbia case study

British Columbia (BC) set a provincial vision for team-based primary healthcare within its *Primary Healthcare Charter* (herein referred to as the *Charter*) in 2007 (British Columbia Ministry of Health 2007). However, even with an overarching policy in place early on, this did not lead to a transformative approach to primary healthcare reform or to the systematic implementation of team-based care (Cavers et al. 2010). The consensus from several key informants was that team-based care only existed in pockets across the province (BC02, BC03, BC04).

The key informants gave several potential reasons why team-based primary healthcare may have failed to spread within British Columbia. One issue they raised was that historically the province focused on incentives for full-service family practice that did not include

team-based care. In 2002, the provincial government set up the General Practice Services Committee (GPSC) under a working agreement with the Doctors of BC (then the British Columbia Medical Association) (Tregillus and Cavers 2011). This approach served to mediate the traditional adversarial relationship between the Ministry of Health and the Doctors of BC (Tregillus and Cavers 2011). The GPSC gave physicians access to dedicated funds by the Ministry of Health aimed at improving family physician practice. Several key informants (BC03, BC01, BC08) noted that physicians had regular opportunities to meet with senior government officials through the GPSC, allowing them to influence the direction of primary healthcare reform. Two key informants (BC01, BC2) noted that although the GPSC is not a policy body per se, it was nevertheless influential because dedicated funds flow through it to facilitate the development of primary healthcare. The lack of representation by other providers and stakeholders in decision-making potentially shaped the direction of policy on team-based care. This perspective was expressed by one key informant below:

I think what needs to happen in BC is we need to make sure we really are getting all these stakeholders to the table and that we're giving them a voice and not just the lip service because many of these policies are very much driven by what medicine needs, not what patients need (BC07).

In 2003, the GPSC launched the Full Service Family Practice initiative to provide financial incentives for family physicians to address key health priority areas within their clinical practice (Lavergne et al. 2014). These included services for patients with complex health needs, maternity care, chronic disease management, care of frail elderly and end-of-life care, preventive services and mental health services (Lavergne et al. 2014). One evaluation of the Full Service Family Practice points to a high uptake of these incentives by physicians that translated into improved access to these services (Hollander 2009). The 2014 *Master Agreement* between physicians and the government included funding for “increased multidisciplinary care between General Practitioners and other healthcare providers” (Government of British Columbia 2014). However, this did not translate into incentives for physicians to contract with other providers or to build teams into their practice. The following quote from one key informant typifies this sentiment:

There's a whole kind of network of programs around incentivizing primary care for physicians. And that I think has been really driven through a policy lens that's trying to get physicians to provide broader care, more holistic care, and really for physicians to lead the charge in this way from a physician-led model, not a team-based model (BC03).

In 2007, the province adopted the *Charter* as a means of outlining the existing primary healthcare challenges in the province and a strategic plan to address them (British Columbia

Ministry of Health 2007). Although many stakeholder groups were part of the crafting of the *Charter*, physicians are explicitly stated as the cornerstone of primary healthcare in the *Charter* (British Columbia Ministry of Health 2017). For several key informants, this set the subsequent policies in resource allocation for primary healthcare, including team-based care. According to one key informant, with funding flowing primarily to physicians, other providers (e.g., nurse practitioners) did not receive the same support (BC03). This raised issues for access to primary healthcare services. The key informant stated that: “physicians are the hub of the circle and it’s really expensive and it’s not very effective because in some communities we can’t get physicians” (BC03).

Physicians who wanted to adopt the team-based model in their clinic often faced variability in the availability of funding streams to support the hiring of other providers (BC08). Other providers such as nurse practitioners, were at times funded through the health regions to work in primary healthcare clinics. However, access to funding to support their services (e.g., salaries, clinic overhead and infrastructure) was uneven in the province and there were only pockets of uptake of nurse practitioner services (BC05, BC07, BC08).

In 2008, two key events took place. British Columbia passed an amendment to the *Health Professions Act* to move interprofessional collaboration forward. More specifically, in the *Act*, the province’s health professional regulatory colleges are encouraged to promote and enhance the following: “(ii) interprofessional collaborative practice between its registrants and persons practising another health profession” (Government of British Columbia 1996). Also in 2008, the GPSC launched the Divisions of Family Practice to improve patient care, increase the influence of family physicians on healthcare delivery and policy and enhance professional satisfaction for physicians. Yet the province did not direct resources for the Divisions toward team-based services; rather, resources were allocated for physician incentives. According to one key informant, it was during this time that the model of team-based care began to falter in the province:

I think we saw the implementation of the Divisions of Family Practice, incentives for GPs to provide better care for lack of a better word and we also at the same time saw a fall off of the inter-professional movement in BC. It seemed to fall off the radar screen and it hasn’t really revived since that time (BC07).

While the *Charter* itself was not updated, team-based primary healthcare emerged in recent policies. For example, team-based care was an objective in the Ministry of Health’s 2014 *Service Plan* (British Columbia Ministry of Health 2014). This signalled an incremental move toward embedding team-based primary healthcare in policy during our study period.

Alberta case study

Alberta has a history of implementing primary healthcare teams through the introduction of the Primary Care Networks (PCNs) in 2005. During that period, Alberta’s approach was to

change the structures for delivering team-based services without any overarching policies to guide this process. It was not until 2014 that Alberta introduced their *Primary Healthcare Strategy* (herein referred to as the *Strategy*) to frame primary healthcare reform in the province (Alberta Health 2014). Thus, team-based primary healthcare services existed without an overarching provincial vision.

This lack of a provincial strategy or vision in part shaped how team-based primary health emerged in Alberta. Alberta's approach was to incorporate the First Minister's provincial agreements on promoting team-based care within a new structure. In 2003, the PCNs and the Primary Care Initiative were established through a Master Agreement between the health regions, Alberta Health and the Alberta Medical Association (AMA) (Spenceley et al. 2013). The key aim for PCNs was to improve access and quality of care using primary healthcare teams. Alberta Health allocated funding to PCNs based on patient enrolment, with the expectation that these funds would be used to build teams (Spenceley et al. 2013). Team configuration was set by the mainly physician-led PCN governing boards to reflect local needs (Ludwick 2011). There were exemplars of high functioning team-based care models adopted by PCNs; however, the expectation of team-based care involving a range of providers did not necessarily translate into reality. One key informant described this below:

... have they (PCNs) truly developed inter-professional collaborative practice? I think it's still side by side, working as a team, but in a side by side siloed kind of way, with the physicians for the most part in PCNs (AB05).

Another issue for implementing team-based care is the role of different payment models. For team-based care to flourish in Alberta, physicians needed incentives and explicit expectations for providing services. In the PCN model, for instance, participating PCN clinics were allocated funding for other team members through provincial funding. However, Alberta's family physicians, many of whom worked under the fee-for-service payment model (Canadian Medical Association 2013), needed to first see the patient to be compensated (AB02, AB04, AB07). In other words, even if the appropriate team member was a nurse or mental health therapist, patients were often required to see the physician first.

The key informants wondered whether the lack of a formal policy framework guiding primary healthcare reform might have affected the adoption of team-based primary healthcare. One key informant noted that the PCNs were formed as Alberta's response to the federal funding for team-based care. However, the lack of a coherent vision at the time of PCN implementation led to a "scatter box" approach (AB02). This, in turn, spurred concerns over a lack of accountability for how resources for team-based services were spent by the PCNs. The 2012 Alberta's Auditor General noted significant weaknesses in the accountability structures for the PCNs and recommended that improved structures be in place to create consistent performance management and financial reporting (Auditor General of Alberta 2012).

A number of actions flowed, in part, from the criticisms in the Auditor's report. In 2012, the newly elected premier introduced a new primary care delivery structure to supplement the PCNs, the Family Care Clinics (FCCs), which could be led by nurse practitioners (Alberta Health 2012). Three pilot FCCs were opened in Edmonton, Calgary and Slave Lake, with a second wave of over 80 announced in 2012. Several Alberta key informants argued that the move was the government's response to the Auditor General's report on the PCNs and the need for clear expectations and targets. The strategic plans governing the FCCs emphasized the accountability of the FCC boards to the Ministry of Health and were required to report on performance measurements (Government of Alberta 2013). One key informant noted that: "I think we're now on recalibrate mode and I think FCCs came out as really a very strong pendulum swing toward defining accountability" (AB02).

However, the introduction of the FCCs was not done through a large-scale consultation process and many stakeholders, including physician groups, had issues with the new model. One key informant (AB05) noted that there was a disconnect between those devising the policy and those in the practice or operational arenas. For instance, the FCCs received a lukewarm response from the AMA. The AMA stressed that the FCCs were not new and at best represented an extension of existing care already delivered through PCNs (AMA 2012).

In 2014, Alberta Health introduced the *Strategy* to provide guidance on primary healthcare reform (Alberta Health 2014). A central component of the *Strategy* is team-based care with the actual configuration of teams to be determined by local needs (Alberta Health 2014). There was a range of provider groups involved in the drafting of the *Strategy* through advisory committees including government, the PCNs and community organizations. Nurses and psychologist organizations were also represented on these committees. Compensation models for team-based services are suggested to be flexible, sustainable and provide incentives within the *Strategy*. It also recognizes the FCC model that *may* include physicians, nurses, dietitians, pharmacists, social workers and psychologists in conjunction with the physician-led PCN model (Alberta Health 2014). How these principles translated into the implementation of team-based services in Alberta's primary healthcare services is beyond the time frame of this study.

What we did observe was that political events in 2014 may have created uncertainties about the direction of team-based primary healthcare reform in Alberta. Concurrent with the release of the *Strategy* in the spring of 2014, leadership at the provincial level changed, and the 80 FCCs approved in 2014 were reduced to nine. By the autumn of 2014, Alberta Health announced that the rollout of the FCCs was subject to further review. An explanation for this change in priorities was absent from the public arena at the time.

Saskatchewan case study

Team-based care is a key component of primary healthcare evolution in Saskatchewan. In 2001, the Saskatchewan Commission on Medicare made primary healthcare central to healthcare reform; they invested in “upstream” services that emphasized illness prevention and health promotion (McIntosh and Marchildon 2009). There was also a focus on interdisciplinary teams rather than solo physician practice (McIntosh and Marchildon 2009). The Commission recommended that primary care teams, comprising a variety of primary care providers (e.g., social workers, pharmacists, nurses, mental health workers), work to achieve improved outcomes for patients. The Commission highlighted the traditional fee-for-service model for physicians as a barrier to moving this agenda forward (McIntosh and Marchildon 2009).

In 2002, Saskatchewan released an *Action Plan for Primary Healthcare* (Saskatchewan Ministry of Health 2002). One goal of the *Plan* was to develop an integrated system of health services available on a 24-hour, 7-day-a-week basis through healthcare teams (Saskatchewan Ministry of Health 2002). This prompted the implementation of roughly 40 primary healthcare teams, mainly in rural areas (Hutchison et al. 2011; Marchildon and O’Fee 2007). There is scant information on these teams; however, one key informant (SK10) noted that these teams often comprised solely nurse practitioners and physicians.

There were several drivers noted by the key informants that shaped team-based primary healthcare in the province, including the move toward patient-centred care, supports for chronic disease management and the appropriate use of services (SK02, SK03, SK05, SK09). Yet even with this prioritization, there were issues noted with the system-wide implementation of team-based primary healthcare in Saskatchewan. Team-based care existed in pockets across the province and that team-based care has not been “mobilized successfully across the province” (SK04).

There are several possible reasons for this lack of mobilization; however, these reasons are nuanced for Saskatchewan. The importance of primary healthcare reform in Saskatchewan was highlighted in the *Framework on Primary Healthcare* (herein referred to as the *Framework*) that was released by the Saskatchewan Ministry of Health in 2012 (Saskatchewan Ministry of Health 2012) after an intensive consultation process with a range of stakeholders’ (i.e., facilitated) meetings. Indeed, other providers, patients and community members were actively involved in the development of the *Framework* (SK01, SK03, SK04). The *Framework* provides a high-level strategic plan for implementing primary healthcare services by the regional health authorities. There was general support for the *Framework* among the key informants (SK03, SK04, SK05, SK06, SK08), especially as a key policy for driving team-based primary healthcare forward. For one key informant, the *Framework* signalled the prioritization of primary healthcare reform:

It [the *Framework*] has really brought us all into the spotlight so a lot of the attention ... I think that it’s a great position to be in where we actually can say, this is a provincial priority that needs to be a regional priority and we’re ready (SK03).

Several key informants noted that the *Framework* also focuses on accountability by identifying measures and reporting outcomes (SK08, SK06, SK10). An accountability framework is embedded within the *Framework*, setting up the lines of responsibility between healthcare providers, Regional Health Authorities and the Ministry in meeting several proposed measures of success including access to team-based care (Saskatchewan Ministry of Health 2012).

Historically, primary healthcare did not have as high a priority as acute care. No hard targets were set for primary healthcare whereas other services had clear targets (e.g., surgical wait times) and funding attached to facilitate the change process. One Saskatchewan key informant noted that primary healthcare reform in general was: “not nearly the priority that certain other sectors are ... like wait times for elective surgery” (SK08).

However, even with the degree of prioritization that team-based primary healthcare received, there were some roadblocks to implementation. One of these was the role of physician incentives and payment obstacles in limiting the scale-up of team-based services across the province. For instance, several noted (SK02, SK03, SK05, SK08, SK10) that there was little incentive for physicians to make major changes to their practice and include other providers as team members, especially under the fee-for-service compensation model. One key informant (SK11) noted that the existing policies in Saskatchewan do not allow for the adequate integration of alternative payment models into the healthcare system. The key informant also noted that “... there’s no willingness to consider changing the regulatory framework or specific regulations that would encourage team-based care” in Saskatchewan (SK11). Getting physicians on board with the changes became the focus of the Ministry of Health and health regions and they focused on physician engagement and support – though this did not necessarily come with any changes to existing compensation agreements to support team-based care in physician clinics. For instance, health regions do not have the autonomy to pay physicians alternative compensation models from their budgets.

Even with these challenges, the province moved ahead with implementing team-based services through the establishment of innovation sites in 2012. The innovation sites were the result of partnerships between the communities and First Nations (as applicable) and the regional health authorities to provide team-based care for the local population. The innovation sites received focused investments and supports for the establishment of eight innovation sites for team-based primary healthcare services (Health Council of Canada 2012). Although the key informants (SK04, SK07, SK11) felt that these innovation sites allowed for flexible team configurations based on the needs of the communities, they argued that a strategy for spreading innovation was needed. One key informant noted that, “... there’s way too much focus I think on the innovation sites and not enough focus on supporting the informal innovation and what’s really working out there outside of the innovation sites and spreading that knowledge elsewhere” (SK11).

Exploring Context and the Factors Shaping Team-Based Primary Healthcare Policies

TABLE 2. Summary of contextual drivers and key actors shaping team-based primary healthcare in British Columbia, Alberta and Saskatchewan 2000–2014

Province	Contextual drivers	Key actors
British Columbia	There was little evidence of the prioritization of team-based primary healthcare within the suite of policies. The province focused more on physician incentives for a wider range of primary healthcare services.	Physicians were noted as the “cornerstone” of primary healthcare in the <i>Charter</i> and were pivotal to shaping primary healthcare policies. Resources were earmarked for physician incentives to provide a wide range of primary healthcare services. Other provider groups and community members did not have the same voice when drafting policies or shaping team-based primary healthcare services.
Alberta	Alberta’s direction was to implement physician-led primary healthcare service delivery through the PCNs in the early 2000s. However, there was no overarching provincial framework in place to set out accountabilities. Primary healthcare services became a political issue in the latter years of our study with the introduction of the FCCs in conjunction with the PCNs. While FCCs were listed as an option for team-based primary healthcare services in the <i>Strategy</i> , they were not resourced beyond the three pilots.	The PCNs were physician-led and governed. There was a move to more inclusive policy processes within the <i>Strategy</i> , which had representation from community organizations, nurses, psychologists, government and PCNs. The policies for the FCCs also stressed a role for communities in governance; however, the actual operationalization of this new governance structure is vague.
Saskatchewan	Team-based primary healthcare emerged early in policies in Saskatchewan and was the central tenet of the Framework. Resources were directed to community-designed innovation sites. However, there were some concerns about the prioritization of primary healthcare as compared to more “urgent” health services.	Saskatchewan had a sustained inclusive approach to policy processes with several actors (including community members) at the table when policies were drafted. In the policies, teams must be connected to a family physician; however, team configuration was largely set by local needs and culture (i.e., the inclusion of Aboriginal healers as key team members for some communities). However, there is little information about how these teams emerged across the province.

FCCs = Family Care Clinics; PCNs = Primary Care Networks.

Discussion

Team-based primary healthcare is implemented in a piecemeal manner across Canada. We wanted to understand more about key actors, context, and the evolution of team-based primary healthcare policy. Indeed, primary healthcare reform did not take place in a vacuum. There are several pre-existing limitations on the development of team-based services that require a larger discussion. The provinces are influenced by the tenets of the *Canada Health Act*, which requires public coverage for medically necessary care given by physicians or hospitals (Hutchison 2008). Public payment for other out-patient healthcare providers, such as mental health therapists and physiotherapists, is often determined by a province’s fiscal circumstances, legislation, policies and political priorities and is therefore highly variable across the provinces (Lewis 2015). Any discussion of team-based care needs to be placed within a larger discussion of the role of the complex relationships between social actors. Physician agreements are negotiated between the province and the provincial medical association. Therefore, the provinces build partnerships and negotiate with physicians on primary healthcare reform within their own jurisdiction. For the most part, any changes to the status quo were and are gradually introduced by the provinces to secure physician buy-in and support (Hutchison et al. 2011; Marchildon and Hutchison 2016).

Each province and territory has a set amount of fiscal and human resources, and in some instances, team-based care was introduced to address issues in access to primary healthcare services in some communities – especially those in rural and remote regions. In this respect, nurse-led teams emerged in several Canadian jurisdictions. Team members, however, may also be “add-ons” to clinics to meet the specific needs of the local populations. Thus, the emergence and configuration of team-based care depends largely on what provinces and territories have available. There are a number of pre-existing contextual factors that set the larger stage for if and how team-based services are implemented in Canada.

Our review of context in three case-study provinces mapped the local policy landscape using Walt and Gilson’s policy triangle (Walt and Gilson 1994). Making clear-cut causal statements about the influence of actors and local events is inappropriate given the high-level scan we did, but it gave us insight into the factors that come together and create what Kingdon referred to as “policy windows” (Kingdon 1995). We noted a number of themes that emerged from our document analysis and interviews with key informants. These included: stakeholder relationships, which were felt to be crucial in determining the direction of policy; concern about “who” gets a place at the policy table; and structural issues to moving team-based primary care forward, including historical models of compensation models and a lack of incentive for change.

To an extent, we found the same scenario reported by others (Hutchison et al. 2011; Lavergne et al. 2014). Getting team-based primary healthcare services off the pages of policy and working on the ground was premised on securing the buy-in of physicians. Indeed, the three provinces prioritized relationship building with physician stakeholders (including physician organizations) when designing policies on team-based care, though the degree and type of physician engagement differed. Denis et al. (2013) argued that primary healthcare reform cannot be successful without the support of family physicians, and that they need to be fully engaged in strategies for primary care reform and this was indeed a critical issue for the three provinces.

This physician engagement and relationship building was most visible in BC. Yet there may be some unintended consequences for team-based care. Our BC informants told us that other provider groups such as nurse practitioners did not have the same access to the provincial government and this may limit the discussion about other potential models of primary healthcare service delivery (e.g., nurse practitioner-led teams). In Alberta, the focus was also on physician-led primary care, although there were efforts to expand leadership opportunities to other members of the primary care team. However, Alberta chose to not change the status quo of physician-led primary healthcare services. Even the action taken to ensure inclusive policy making processes in Saskatchewan did not negate the necessity of securing support and buy-in from physicians when it came time to actually implement team-based care.

The implicit linkage between politics and professional power dynamics should prompt Canadian policy makers to reflect on who gets a voice in agenda-setting and policy making. There was a general move toward inclusive policy making. However, it was not clear

to us or to some of the key informants how this worked in practice. For instance, committees were struck in Alberta to draft the *Primary Care Strategy*; however, more needs to be known about what happened within these committees and whether some voices were “louder” than others. Some authors have called for the establishment of mechanisms to ensure representation of all primary health team members on provincial policy committees (DiCenso et al. 2010).

To make team-based healthcare services truly patient-centred, actively engaging patients in policy making is also important because they come with the lived experience of service provision (Lenihan 2012; Mulvale et al. 2015). This requires considerable forethought given the complexity of engagement processes and the resources required. However, truly engaging community members, primary healthcare team members, government and patients will change the dynamics of how we prioritize team-based care and allocate resources (Thurston et al. 2005).

Another key theme that emerged is the need for resources to support team-based services. For instance, a lack of targeted provincial funding can leave physician clinics and health regions care scrambling to resource team-based models of care. We need to have a fulsome discussion about consistent and sustained funding models for team-based services (Clelland 2015). A related issue raised by the key informants is the perpetuation of current compensation models – especially fee-for-service models – and funding streams that do not promote team-based care. Other authors have noted challenges in implementing team-based care when different compensation models and funding streams operate in each province and territory, with no consensus on how this can be reconciled (Reeves 2006; Virini 2012). Interestingly, Alberta’s *Strategy* points to the need for flexibility in compensation models to move team-based care forward (Alberta Health 2014). Yet even with this engrained in policy, changing compensation models (especially fee-for-service) and funding streams are slow to emerge and will require decisive political action. Finally, we noted that a lack of incentives to promote team-based services continues to undermine change efforts. In British Columbia, we observed that resources for team-based services were neglected in favour of physician incentives to provide a wider range of services. When funding for team-based care is directed at physicians, there are limited financial incentives for them to share service provision with other members of the team (Health Council of Canada 2008).

In the end, there are some indications of a lack of spread of high functioning team-based services, with key informants from British Columbia stating that the momentum for team-based services in primary healthcare had effectively stalled in 2014. Alberta and Saskatchewan key informants also noted that there were pockets of excellence in their province, but that successful scale-up had not yet been achieved. The lack of resources may be one. Another may be the need for political action to stimulate policies that move team-based services forward and their effective adoption. This means placing primary healthcare on the political agenda and taking a long-term and sustained approach beyond the short-term political cycles.

Limitations

We heed the cautions set out by Blank and Burau (2013) when they stress that policy development and implementation take place in a highly complex fashion and that understanding the complex interplay between context, actors and policy is challenging. Providing a full and nuanced set of narratives requires careful planning, guidance and resources. Using the policy triangle required considerable thought about the best tools to capture the constant flux of policy development. This is in line with Gilson's (2012) assertion that health policy research be a constant process of conceptualizing and re-conceptualizing. Indeed, we only took a snapshot in time; this limited the extent we were able to analyze the role of the longer-term context that shaped provincial policies (e.g., economic downturns, workforce shortages). Although these issues did not emerge as significant policy drivers in our study, they nevertheless require further exploration.

While we found the framework useful for identifying the high-level issues that require further investigation, we could only tell part of the story about how team-based care emerged in policies. It was very difficult to make explicit connections between events, social actors (along with their motivations and standpoints) and the emergence of policies. Walt et al. (2008) noted the challenges of policy researchers when situated as outsiders to the decision-making process and not being privy to the "behind the scenes" dynamics. They suggest embedding policy researchers within the policy environment to gain access to the meetings and discussions that would provide a more detailed understanding of motivations and intentions and the rationales for policy choices. Finally, policies on team-based care continue to evolve. Our study does not reflect the more recent state of policy drivers in the three provinces.

Conclusion

In the early 2000s, the Canadian provincial/territorial and federal governments agreed to improve access to a multidisciplinary primary healthcare teams (Hutchison 2013). Several authors have argued that Canada still lags behind other countries in reforming primary healthcare (Aggarwal and Hutchison 2012; Hutchison 2013; Johnson and Hogel 2016). Instead, we have a patchwork approach to team-based primary healthcare across the provinces with varying degrees of success. Some of this can be attributed to the provinces designing healthcare systems for their local needs. That said, we observed in our study that there was more at play than the desire to meet local needs. We used the policy triangle to begin disentangling these contextual factors and to identify the key actors who influence policy and resources. Policies on team-based care in the provinces were deeply rooted within pre-existing power dynamics and relationships. The review also highlighted the significant influence of changes in political leadership and prioritization in driving policies on team-based care. Our overall findings highlight the value of reviewing the context, relationships and power dynamics, which come together and create "policy windows" at different points in time. We recommend that policy makers be cognizant of the complex relationships that influence policies governing team-based care to locate possible sticking points in its adoption.

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