

HEALTHCARE

POLICY

Politiques de Santé

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

Volume 3 ♦ Number 4

Indicator Madness: A Cautionary Reflection on the Use of Indicators in Healthcare

SARAH BOWEN AND SARA A. KREINDLER

Parallel Lines Do Intersect: Interactions between the Workers' Compensation and Provincial Publicly Financed Healthcare Systems in Canada

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*Data Matters ♦ Discussion and Debate ♦ Research Papers
Knowledge Translation, Linkage and Exchange*

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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.

Healthcare Policy/Politiques de Santé 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.

Nous publions des articles savants et des rapports de recherche qui appuient l'élaboration de politiques et le processus décisionnel dans le domaine de la santé et qui abordent des aspects aussi variés que la gouvernance, l'organisation et la prestation des services, le financement et la répartition des ressources. La revue accueille favorablement les articles rédigés par des chercheurs provenant d'un large éventail de disciplines dans les sciences de la santé, les sciences sociales et la gestion, et par des équipes de recherche interdisciplinaires. Nous invitons également les décideurs ou les membres d'équipes formées de chercheurs et de décideurs à nous envoyer des articles qui traitent de l'échange et de l'application des connaissances.

Bien que *Healthcare Policy/Politiques de Santé* 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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Progressive Licensing of Drugs: Music or Noise?

THE LATEST SONG FROM THE HEALTH CANADA HYMNAL IS ABOUT PROGRESSIVE licensing. At present, once a new drug is approved for marketing, or – in the language of the *Food and Drugs Act* – receives a Notice of Compliance (NOC), Health Canada effectively loses control over it. True, drug companies are required to report adverse drug reactions (ADRs) that they become aware of, and in cases where safety is a major concern, Health Canada can either negotiate with the company involved to send out “Dear Doctor” letters or, in extreme situations, withdraw the drug from the market. But outside of these instances, Health Canada has no legislative authority over drugs already on the market.

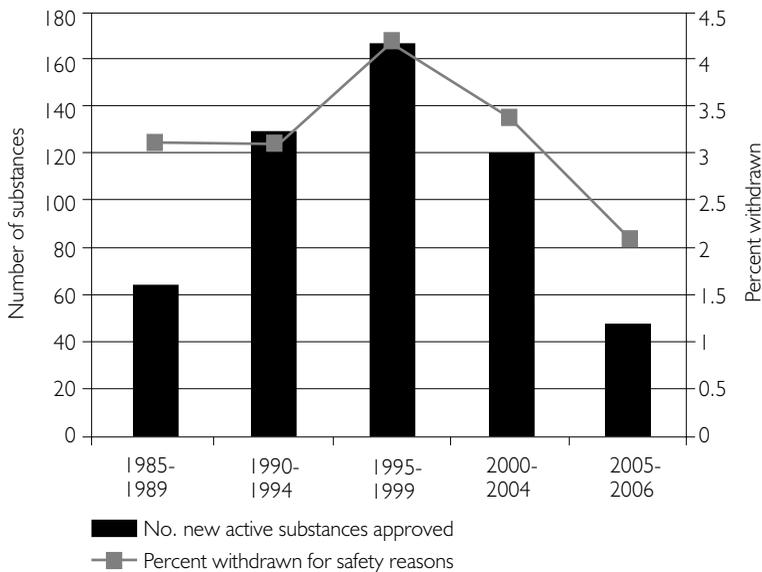
Over the past two decades, Health Canada has been forced to withdraw 3%–4% of the new drugs it approves in any five-year period because they prove to be unsafe (see Figure 1). Although that percentage seems stable, pharmaceutical companies aggressively promote new drugs as soon as they are approved. As a result, hundreds of thousands of prescriptions are written for them in the first few months after they are launched (IMS Health Canada 2000). New drugs are usually tested in relatively homogeneous populations, but many prescriptions are written for a much more heterogeneous group of patients in whom the new drug’s benefit-to-risk ratio is often not known.

The aim of progressive licensing is to move from an “all or none” position – either license the drug or don’t – to an approach that follows drugs throughout their entire life cycle. Here is what Health Canada says about progressive licensing on its Web page: “Progressive Licensing means that Health Canada would assess the benefits and risks of a product before and after it reaches the market, establishing a stable regulatory standard that reflects a lifecycle approach to drug regulation” (Health Canada 2008). The promise of this new system is that continuous re-evaluation of the risks and benefits of medications will identify serious safety issues earlier and improve the targeting of drug therapy. On April 8 of this year, Prime Minister Stephen Harper unveiled new legislation (Bill C-51) incorporating the principles of progressive licensing (Weeks and Galloway 2008).

The worry in some quarters has been that there will be a trade-off between pre- and post-marketing evaluation – more post-marketing surveillance in exchange for faster pre-marketing approval. This equation was used in the United Kingdom in the past. According to an analysis from John Abraham at the University of Sussex

(Abraham and Davis 2005), the result was that 2.6 times as many drugs were removed from the British market between 1971 to 1992 compared to the United States, where the Food and Drug Administration (FDA) was conducting longer and more thorough pre-marketing evaluations. When US drug approvals started speeding up in the mid-1990s, estimates suggest that for every one-month reduction in a drug's review time, there was a 1% increase in expected reports of ADR hospitalizations and a 2% increase in expected reports of ADR deaths (Olson 2002).

FIGURE 1. Safety withdrawals of drugs as a percentage of approvals, 1985–2006



Federal Minister of Health Tony Clement has assured Canadians that “there are no changes that lower the safety standards, or speed up drug approvals” (Clement 2008), but according to one advocate for progressive licensing (Weeks 2008), it will allow Health Canada to approve drugs that it may have rejected previously, especially those with limited evidence of efficacy at the time that Health Canada sees them. In fact, Health Canada has had a similar policy since 1998: the Notice of Compliance with conditions (NOC/c). The goal of this policy is to “provide patients suffering from serious, life threatening or severely debilitating diseases or conditions with earlier access to promising new drugs” where surrogate markers suggested that these new products offered “effective treatment, prevention or diagnosis of a disease or condition for which no drug is presently marketed in Canada or significantly improved efficacy or significantly diminished risk over existing therapies” (Health Canada 1998). In return for being allowed on the market, companies commit to undertake additional trials to verify the initial promise of their drugs.

As of January 2008, a total of 38 NOC/c's had been issued for 31 different products (some drugs received more than one NOC/c). However, one of these drugs received its NOC/c in August 1999 and still has not fulfilled its conditions, while others have been on the market for five or six years with an NOC/c. Health Canada does not provide any information about the progress of the studies that companies committed to, so the general public and health practitioners alike are in the dark as to how effective, if at all, these drugs are (Lexchin 2007). Whether or not Health Canada will do any better at monitoring and enforcing commitments under progressive licensing remains to be seen.

Moreover, the trials that are used to grant an NOC/c, and that will be used to get promising new drugs to market faster under progressive licensing, are almost always industry-funded trials designed to generate data for approval purposes. Often, the trials that show promise for serious conditions are stopped before completion on the grounds that continuing to give patients either a placebo or an inferior comparator would be unethical. An article in *JAMA* in 2005 concluded that early stopping is becoming more common, and that these studies “often fail to adequately report relevant information about the decision to stop early, and show implausibly large treatment effects, particularly when the number of events is small” (Montori et al. 2005). To the extent that it relies on trials that were stopped early, Health Canada will need to be extremely vigilant with any products that it approves under progressive licensing.

TABLE 1. Relative funding of Therapeutic Products Directorate and Marketed Health Products Directorate, 2004

Directorate	Approximate annual operating cost base (year ended March 31, 2004)	Approximate number of employees (as at March 31, 2004)
Therapeutic Products Directorate	\$38 million	423
Biologics and Genetic Therapies Directorate	\$22 million	228
Health Products and Food Branch Inspectorate	\$16 million	190
Marketed Health Products Directorate	\$8 million	90
Total	\$84 million	931

Source: Progestic International 2004.

Ongoing monitoring of medications by Health Canada will require new resources to be injected into the post-marketing surveillance system. Table 1 shows the considerable imbalance in personnel and resources available to the Therapeutic Products Directorate, the branch that approves new drugs, and the Marketed Health Products

Directorate, the branch that looks after post-marketing surveillance (Progestic International 2004). The federal budget in February 2008 allocated \$113 million over two years to “modernize and strengthen Canada’s safety system for food, consumer products and health products” (Flaherty 2008), but there is no indication as to how much of that money will go to post-marketing surveillance of medications.

Under Bill C-51, Health Canada, acting through the Minister of Health, will be given the additional authority to issue the market authorization for a drug subject to additional terms and conditions and suspend the authorization if the company does not follow through on its obligations (Government of Canada 2008). In practice, these new powers will likely mean that Health Canada will be able to require companies to carry out post-marketing studies to look at both safety and effectiveness. While in theory this additional information should be valuable in assessing where new products should fit into the therapeutic armamentarium, in reality there are worries about relying on industry-funded studies. A narrative systematic review has shown that commercially sponsored research is much more likely to result in positive outcomes than research funded from any other source (Sismondo 2008).

Finally, any legislative changes to improve knowledge about new drugs should incorporate provisions to enhance public access to information about their safety and effectiveness. The pre-marketing data from clinical trials that companies submit to Health Canada are currently treated as confidential business information and will not be released, even through an Access to Information request, without the express agreement of the company involved. Not only does Bill C-51 offer no substantial change to this situation but it contains a clause that specifically cites trade agreements such as NAFTA (*North American Free Trade Agreement*) as a reason for not releasing information. The bill also seems to be silent about whether or not the results of industry-funded post-marketing studies will be made public. The use of trade agreements as an argument for refusing to release clinical trial data is hard to countenance, since the FDA routinely posts redacted reviewers’ comments about new drugs on its website.

If you listen hard, you can hear the song of progressive licensing growing louder. Will it turn out to be music to the ear, or just noise?

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Editor

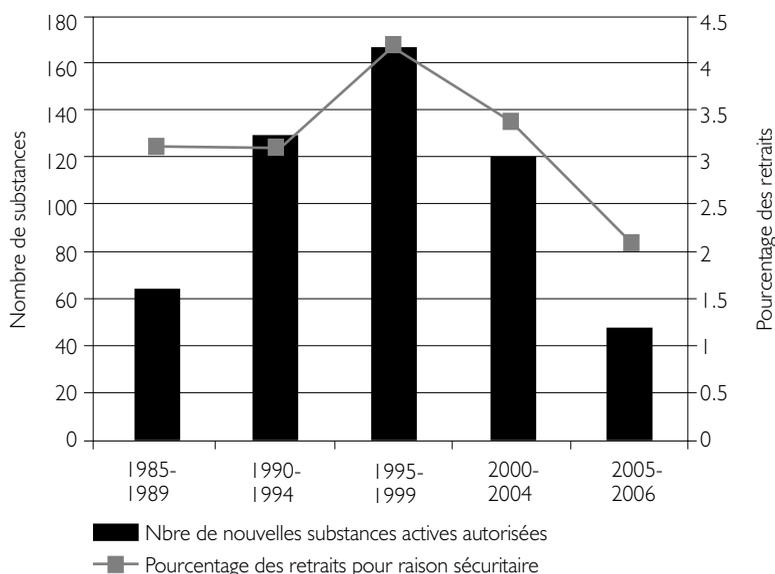
Homologation progressive des médicaments : promesse ou cacophonie ?

UN DES DERNIERS PROJETS DE SANTÉ CANADA CONCERNE L'HOMOLOGATION progressive des médicaments. Dans l'état actuel, au moment où un médicament reçoit l'autorisation pour la mise en marché, c'est-à-dire l'avis de conformité (AC) dans le langage de la Loi sur les aliments et drogues, Santé Canada perd pratiquement le contrôle sur ce médicament. Il est vrai qu'on exige des compagnies pharmaceutiques qu'elles déclarent les effets indésirables des médicaments (EIM) dont

elles prennent connaissance; et, dans les cas où il y a des risques importants pour la sécurité, Santé Canada peut négocier avec les compagnies une « lettre aux médecins » ou encore, dans les cas extrêmes, retirer le médicament du marché. En dehors de ces mesures, Santé Canada n'a aucune compétence législative sur les médicaments qui circulent déjà sur le marché.

Au cours des vingt dernières années, Santé Canada s'est vu obligé de retirer, pour toute période donnée de cinq ans, de 3 à 4 pour cent des nouveaux médicaments autorisés, en raison des risques qu'ils posaient (voir figure 1). Bien que ce pourcentage semble stable, les compagnies pharmaceutiques livrent d'importantes campagnes de mise en marché pour les nouveaux médicaments, et ce, dès leur autorisation. En conséquence, des centaines de milliers d'ordonnances sont délivrées pour ces médicaments dans les premiers mois de leur mise en marché (IMS Health Canada 2000). Les nouveaux médicaments sont habituellement testés auprès de populations relativement homogènes, cependant, de nombreuses ordonnances sont délivrées pour des groupes de patients beaucoup plus hétérogènes, pour lesquels le rapport avantages-risques demeure souvent inconnu.

FIGURE 1. Pourcentage du retrait sécuritaire des médicaments en fonction du nombre d'autorisations, 1985–2006



L'objectif d'une homologation progressive est d'éviter la situation du « tout ou rien » – accorder ou non l'autorisation – et de mettre en place une approche qui permet le suivi des médicaments tout au long de leur cycle de vie. Voici ce que dit Santé Canada, sur son site Web, au sujet de l'homologation progressive : « l'homologation progressive signifie que Santé Canada évaluerait les avantages et les risques d'un pro-

duit, avant et après la commercialisation, pour établir une norme de réglementation stable en accord avec l'approche du cycle de vie à la réglementation du médicament » (Santé Canada 2008). Ce nouveau système laisse entendre qu'une réévaluation continue des risques et des avantages permettra de détecter de façon précoce les problèmes sérieux de sécurité et de mieux déterminer la catégorie thérapeutique des médicaments. Le 8 avril 2008, le premier ministre Stephen Harper dévoilait la nouvelle réglementation (projet de loi C-51) concernant les principes de l'homologation progressive (Weeks et Galloway 2008).

On s'inquiète, dans certains milieux, de la possibilité d'un compromis entre les évaluations avant et après la commercialisation, c'est-à-dire qu'il y aurait plus de surveillance après la mise en marché en échange d'une autorisation accélérée. Auparavant, le Royaume-Uni se trouvait dans une situation de ce genre. Selon une analyse de John Abraham, de l'Université Sussex (Abraham et Davis 2005), cela a eu pour conséquence que 2,6 fois plus de médicaments étaient retirés du marché britannique entre 1971 et 1992, comparativement aux États-Unis où la Food and Drug Administration (FDA) menait des évaluations avant la commercialisation plus poussées et s'échelonnant sur de plus longues périodes de temps. Vers le milieu des années 1990, l'homologation s'est accélérée aux États-Unis et les estimations indiquent que pour chaque tranche d'accélération d'un mois dans l'évaluation d'un médicament, il y a eu une augmentation de 1 pour cent des rapports d'hospitalisations dues aux EIM et de 2 pour cent des rapports de mortalité due aux EIM (Olson 2002).

Le ministre fédéral de la Santé, Tony Clement, a assuré que « les modifications n'allaient pas permettre une baisse des normes de sécurité ou accélérer les processus d'autorisation » (Clement 2008), mais selon un défenseur de l'homologation progressive (Weeks 2008), les mesures permettront à Santé Canada d'autoriser des médicaments qui auraient pu être rejetés, particulièrement ceux pour lesquels il existe peu de données quant à leur efficacité au moment où Santé Canada les prend en considération. En fait, depuis 1998, il existe une politique similaire à Santé Canada : l'avis de conformité avec conditions (AC-C). L'objectif de cette politique est de « permettre aux personnes atteintes d'une maladie ou affections grave, mettant la vie en danger ou sévèrement débilitante d'avoir plus rapidement accès à de nouveaux médicaments prometteurs » dans le cas où les marqueurs de substitution permettent de croire que ces médicaments offrent « un traitement, une prévention ou un diagnostic efficace d'une maladie ou condition pour lesquelles aucun médicament n'est actuellement commercialisé au Canada, ou une efficacité améliorée significative ou une diminution significative du risque, par rapport aux thérapies actuelles » (Santé Canada 1998). En échange de l'autorisation sur le marché, les compagnies s'engagent à entreprendre des essais supplémentaires afin de vérifier les effets escomptés des médicaments en question.

En janvier 2008, on comptait 38 AC-C émis pour 31 produits (certains médicaments peuvent recevoir plus d'un AC-C). Cependant, un de ces médicaments,

qui avait reçu son AC-C en août 1999, n'avait toujours pas satisfait aux conditions, tandis que les autres circulaient sur le marché avec un AC-C depuis cinq ou six ans. Santé Canada ne donne pas d'information sur les progrès des essais auxquels se sont engagées les compagnies. Ainsi, le public en général tout comme les praticiens de la santé ne connaissent pas le degré d'efficacité, le cas échéant, de ces médicaments (Lexchin 2007). Reste à savoir si, dans le cadre d'une homologation progressive, Santé Canada assurera un meilleur suivi ainsi que le respect des engagements conclus.

De plus, les essais liés au AC-C, et qui seront aussi utilisés pour commercialiser plus rapidement les médicaments prometteurs dans le cadre de l'homologation progressive, sont presque toujours financés par l'industrie et conçus pour produire des données à des fins d'autorisation. Souvent, quand un médicament semble prometteur pour une maladie grave, les essais sont interrompus avant terme en invoquant qu'il est contraire à l'éthique de continuer à donner aux patients un placebo ou un médicament de comparaison de qualité inférieure. Un article du JAMA, publié en 2005, conclut que l'arrêt précoce des essais est de plus en plus courant et ajoute qu'« il y a souvent un manque d'information pertinente au sujet de la décision de mettre fin aux essais et que les effets à long terme des traitements demeurent inconnus, particulièrement quand le nombre de cas est réduit » (Montori et al. 2005). Dans la mesure où seront pris en compte des essais auxquels on a mis fin de façon anticipée, Santé Canada devra faire preuve d'une extrême vigilance pour tout produit autorisé dans le cadre d'une homologation progressive.

Pour faire face aux défis liés à la surveillance continue des médicaments, Santé Canada devra injecter de nouvelles ressources dans le système de surveillance après la commercialisation. Le tableau 1 présente le déséquilibre considérable en fait d'effectif et de ressources entre la Direction des produits thérapeutiques, qui s'occupe de l'autorisation des nouveaux médicaments, et la Direction des produits de santé commercialisés, qui s'occupe de la surveillance après l'autorisation de mise en marché (Progestic International 2004). Le budget fédéral de 2008 prévoit 113 millions de dollars, répartis sur deux ans, afin de « moderniser et de renforcer le système canadien de salubrité des aliments ainsi que des produits de consommation et de santé » (Flaherty 2008), mais il n'y a pas d'indication sur la part de cet argent qui ira à la surveillance des médicaments après l'autorisation de mise en marché.

Dans le cadre du projet de loi C-51, Santé Canada, par l'entremise du ministre de la Santé, jouira de pouvoirs additionnels pour autoriser la commercialisation d'un médicament sous conditions supplémentaires, et pourra retirer l'autorisation si la compagnie ne respecte pas ses obligations (Gouvernement du Canada 2008). Dans la pratique, ces nouveaux pouvoirs permettront sans doute à Santé Canada d'exiger des compagnies qu'elles effectuent des essais après la commercialisation pour étudier les questions de sécurité et d'efficacité. Bien qu'en théorie cette information soit précieuse pour évaluer la place des produits dans le répertoire thérapeutique, dans la réalité on

peut à juste titre s'inquiéter d'une dépendance par rapport aux études financées par l'industrie. Une revue systématique narrative a démontré que la recherche commanditée par des intérêts commerciaux est plus susceptible de donner des résultats positifs qu'une recherche financée par d'autres sources (Sismondo 2008).

TABLEAU 1. Financement comparatif entre la Direction des produits thérapeutiques et la Direction des produits de santé commercialisés, 2004

Direction	Coûts d'exploitation annuelle approximatifs (année se terminant le 31 mars 2004)	Nombre approximatif d'employés (en date du 31 mars 2004)
Direction des produits thérapeutiques	38 millions \$	423
Direction des produits biologiques et des thérapies génétiques	22 millions \$	228
Inspectorat de la Direction générale des produits de santé et des aliments	16 millions \$	190
Direction des produits de santé commercialisés	8 millions \$	90
Total	84 millions \$	931

Source : Progestic International 2004.

Pour terminer, tout changement à la loi dont le but est d'améliorer les connaissances sur les nouveaux médicaments devrait comprendre des articles qui prévoient l'accès public à l'information traitant de la sécurité et de l'efficacité. Les données des essais cliniques avant la commercialisation remises par les compagnies à Santé Canada sont présentement traitées comme des renseignements commerciaux confidentiels et ne sont pas divulguées sans l'autorisation de la compagnie concernée, et ce, même si une demande d'accès à l'information est déposée. Le projet de loi C-51 n'apportera aucun changement appréciable dans ce sens; en fait, on y trouve un paragraphe qui réfère spécifiquement aux accords commerciaux tels que l'ALENA (*Accord de libre-échange nord-américain*) comme raison pour ne pas divulguer les renseignements. Il semble que le projet de loi omette également la question de la divulgation publique des résultats d'études après la commercialisation financées par les compagnies. Le recours aux accords commerciaux pour justifier le refus de rendre publiques les données des essais cliniques est difficile à admettre, puisque la FDA publie régulièrement sur son site Web les commentaires écrits d'examineurs au sujet de nouveaux médicaments. Si vous prêtez l'oreille, vous pouvez entendre de plus en plus la voix d'une homologation progressive des médicaments. S'agit-il d'une promesse positive ou d'une simple cacophonie ?

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Rédacteur

Thomas McKeown, Meet Fidel Castro: Physicians, Population Health and the Cuban Paradox

Thomas McKeown, rencontre avec
Fidel Castro : Médecins, santé de la population
et paradoxe cubain



by ROBERT G. EVANS

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Abstract

About 40 years ago, Thomas McKeown demonstrated that the historic decline in the great killer diseases owed little or nothing to progress in medicine. A generation of research on population health followed, highlighting the large social gradients in health within populations. These vary greatly across societies, but appear largely unrelated to medical care. Medicine was acknowledged as “powerful, but within limits”; the major determinants of health lie elsewhere.

We may have missed something. Cuba has achieved “first world” population health status despite a minimal economic base. Far from marginalizing medicine, Cuba has by far the world’s largest physician workforce. But doctors’ roles are significantly expanded. The system seems to work.

Résumé

Il y a environ 40 ans, Thomas McKeown démontrait que le déclin historique des principales maladies mortelles était peu ou pas du tout attribuable aux progrès de la médecine. Depuis, les nombreuses recherches sur la santé des populations ont mis en relief l'ampleur des gradients sociaux de la santé au sein des populations. Ces gradients varient énormément d'une société à l'autre, mais semblent peu liés aux services médicaux. Il a été reconnu que la médecine était « puissante, bien que limitée »; les principaux déterminants de la santé se trouvant ailleurs.

Il est possible que nous ayons passé outre quelque chose. Cuba est parvenue à un statut de santé comparable à celui des pays industrialisés, et ce, en dépit d'un tissu économique limité. Loin de marginaliser la médecine, Cuba est dotée du plus important effectif de médecins au monde. Mais leur rôle y est largement étendu. Le système semble bien fonctionner.

ABOUT 40 YEARS AGO, THOMAS MCKEOWN FIRED A SHOT ACROSS THE BOW of medicine whose echoes still reverberate faintly. Studying mortality records for England that go back to the first half of the 19th century, he demonstrated that the very large declines in mortality from a number of major infectious diseases pre-dated not only the development of effective medical therapies but also scientific understanding of the disease processes themselves (McKeown 1979). The major killers of the 19th century are still around, but their impact on the health of the English population, or any other high-income population, has almost disappeared – for reasons quite independent of medical progress. As a “diagnosis of exclusion,” McKeown “emphasized instead the importance of economic growth, rising living standards, and improved nutrition as the primary sources of most historical improvements in the health of nations” (Szreter 2002).

Human society has been transformed over the last century and a half by the decline in mortality at all ages and the increase in life expectancies. Over the same period there have been enormous advances in biomedical science, and in the last half century these have translated into huge increases in the resources devoted to the provision of medical care. (Between 1960 and 2005, the share of greatly increased national incomes spent on healthcare in OECD countries more than doubled; in the United States it tripled.) It is intuitively plausible to assume that these trends are causally linked – *post hoc ergo propter hoc*.

The general public are happy to give modern medical care credit for these great benefits, and the providers of care have been willing to accept. McKeown's demonstration that correlation is not the same as causation, at least with respect to infectious

disease, was understandably unpopular and controversial. He could not be directly refuted – the data and the timing were what they were – but clinicians largely ignored his observations. Anyway, that was then; this is now.

Furthermore, McKeown somewhat overplayed his hand. His leading example, tuberculosis, does in fact show a marked downturn in mortality rates in the late 1940s, when effective medical therapy was developed. In the long historical sweep, the overall decline is so large that it is easy to miss this kink, but in relative terms – and to the patients and doctors of the late 1940s – the effect was very significant. They might understandably reject the claim that “medicine doesn’t matter” while missing the crucial point that on the larger historical scale, other and more powerful factors had been at work.

But Public Health Matters -- or Did?

Perhaps more seriously, McKeown took too restrictive a view of those other factors. Because TB is not a water-borne bacillus, he argued that the decline in TB mortality could not be a result of cleaner water and better sewage disposal. Public health measures deserved no more credit than medicine. This interpretation was effectively challenged by Szreter (1988), who noted that TB was an “opportunistic” infection, taking advantage of the presence of other infections that *were* water-borne. Gastro-intestinal diseases, in particular, tend to reduce the nutritional uptake from food consumption. But sanitary measures reducing the prevalence of gastro-intestinal disease could then increase the nutritional value of diets, and more generally improve “host resistance.” No matter how wealthy you are, drinking sewage is a seriously bad idea.

McKeown’s medical scepticism continues to find support, however, in aggregate data on population health. When compared across high-income countries, measures such as life expectancy, age-adjusted mortality or potential years of life lost do not show a correlation with expenditures on healthcare or the available supply of doctors or other personnel, or hospital capacity. Nor, however, do they show any correlation with average per capita income levels. In low- and middle-income countries there is quite a strong correlation with both income and health spending, making it impossible to infer anything about which, if either, is the more important factor.

Yet there is within high-income countries a more or less pronounced gradient in health that is closely correlated with income, education and other measures of social status. There is thus a paradox: *within* countries, income is correlated with health, but *among* (high-income) countries, it is not. This observation underlies a generation of research on the social determinants of health, with particular interest in how social position influences health status, and thus in the relative equality or inequality of social positions in different societies.

Population Health and Medicine: Two Solitudes?

Medicine is not among the potential explanations. Virtually all high-income countries have more or less universal access to modern healthcare systems, leading researchers to discount the significance of medical care as an explanation of the social gradient. Where there are identifiable populations with significantly restricted access to healthcare, one can in fact observe corresponding health consequences – as among the uninsured population in the United States. Medicine does matter. But the more intellectually challenging question has been the sources of the social gradient in the general populations of high-income countries.

The marginalization of the medical profession that was explicit in McKeown's findings has thus continued through the subsequent generation of research on the determinants of population health. No one would now deny the powerful contribution of modern medicine to improvements in longevity, function and quality of life of individuals. But it is, I think, fair to say that the general attitude of students of population health is that medical care is "powerful within limits" and cannot explain the major gradients in health within populations any more than it can explain the historical changes studied by McKeown.

This view has only been strengthened by a generation of research on variations in patterns of clinical care. The most intensive investigations, in the United States, find that regions with greater volumes and higher costs of care actually have no greater patient satisfaction, slightly worse mortality outcomes and lower quality of care (see Evans 2007 for references). Where there are more doctors, and greater hospital or equivalent capacity, costs are much higher but outcomes are worse, not better.

It is therefore not surprising that study of the social determinants of health has been viewed by most physicians with at best, indifference and at worst, outright hostility. It is seen as a potential threat to their status – and their incomes. (Ironically, most of the leading students of the social determinants of health, from Rudolf Virchow to Sir Michael Marmot and Fraser Mustard – and including that medical iconoclast, Thomas McKeown – have been physicians.)

But students of population health (present company included) may have missed something.

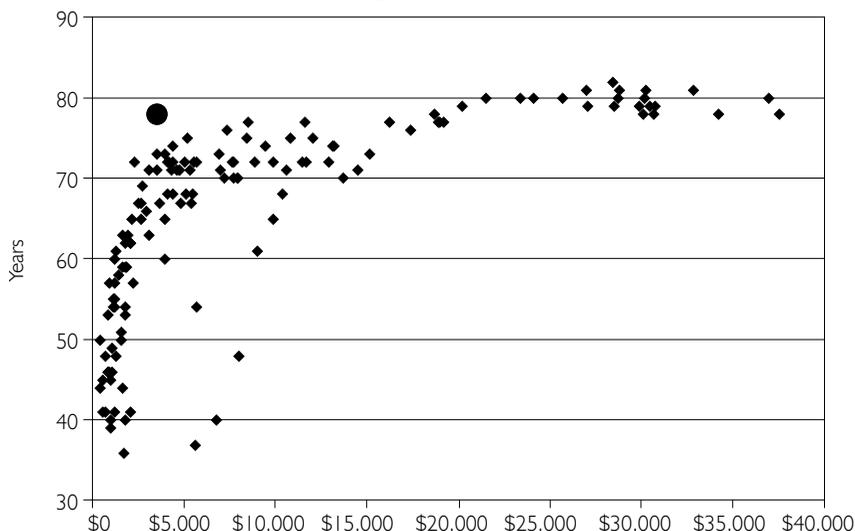
The Black Swan

The exception, it is often said, proves the rule. ("Proves" here has its original meaning of testing, not confirming.) One black swan suffices (subject to a bit of scrubbing) conclusively to refute the proposition "All swans are white." The Cuban experience, over the last 50 years, may be just such a black swan. Spiegel and Yassi (2004: 204) refer to it as "the Cuban health paradox":

It is widely recognized that Cuba, despite poor economic performance, has achieved and sustained health indices comparable to those in developed countries

The remarkable Cuban achievement with respect to population health emerges clearly from the *World Health Report* (WHR) (WHO 2006). Figures 1a and 1b combine data from the Statistical Annex to show the relationship between per capita GDP and two different measures of population health – life expectancy at birth and expected mortality per thousand population under five years of age.¹ Both figures show a similar pattern, with a strong overall relation between income levels and health status but with very important qualifications.²

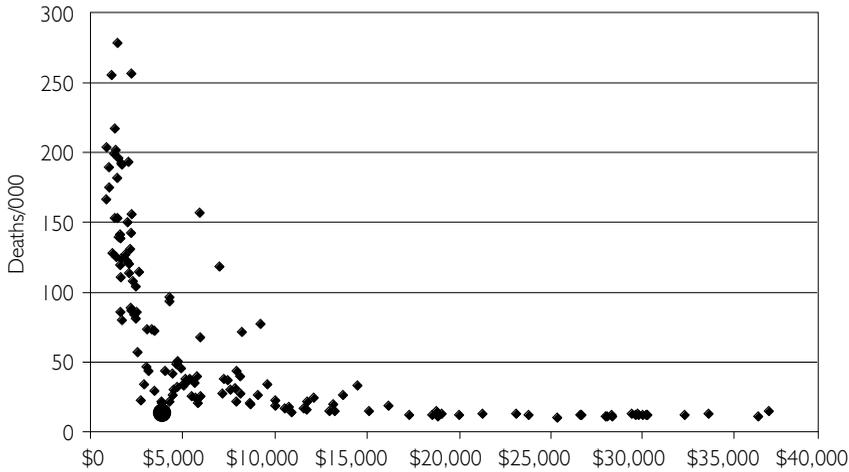
FIGURE 1A. Life expectancy at birth plotted against GDP per capita, 139 countries



Source: WHO 2006, Statistical Annex, Tables 1 and 3.

In high-income countries there is no relationship between per capita GDP and either of these measures of health status. For mortality under five years of age, the relationship disappears above a per capita GDP of \$15,000; for life expectancy, there is some suggestion of a relationship up to \$20,000 per capita. But the relationship is unclear among countries at the very lowest incomes. A fitted trend line would indicate a very powerful relationship, but comparison of individual country observations shows very large differences in health measures for countries with the same reported levels of income. Inter-country differences in factors other than income are obviously exerting a very powerful effect on health – which is not the case for higher-income countries.

FIGURE 1B. Mortality before age 5 plotted against GDP per capita, 139 countries



Source: WHO 2006, Statistical Annex, Tables 1 and 3.

And then there is Cuba.

High up on the far left for life expectancy, and low down on the left for under-five mortality (expanded circles), Cuba's health measures are comfortably within the band of the highest-income countries while its per capita income, at \$3,438, places it 86th among the 139 countries plotted – roughly in the middle of the third quartile. The health of Cuba's population matches or exceeds, on average, that of the United States. Among countries with similar income levels, the best achieve under-five mortality rates twice that of Cuba, and the rest are three, four or five times as high. The best life expectancies are five years shorter; others are 10 or more years shorter. The differences are extraordinary.

The world data span the full range of cultures and environments. Figures 2a and 2b restrict attention only to the Americas. But they tell the same story, permitting the graph to be spread out more widely. The wealth and good health of Canada and the United States stand out on one side of the figure; the poverty and ill health of Haiti on the other. But in number two position on life expectancy, behind Canada and in a tie with the United States, is Cuba. Chile and Costa Rica are right behind, but with much higher income levels than Cuba. And on child mortality, Cuba edges out the United States and Chile to lie right behind Canada. The margin over other countries runs from large to very large.

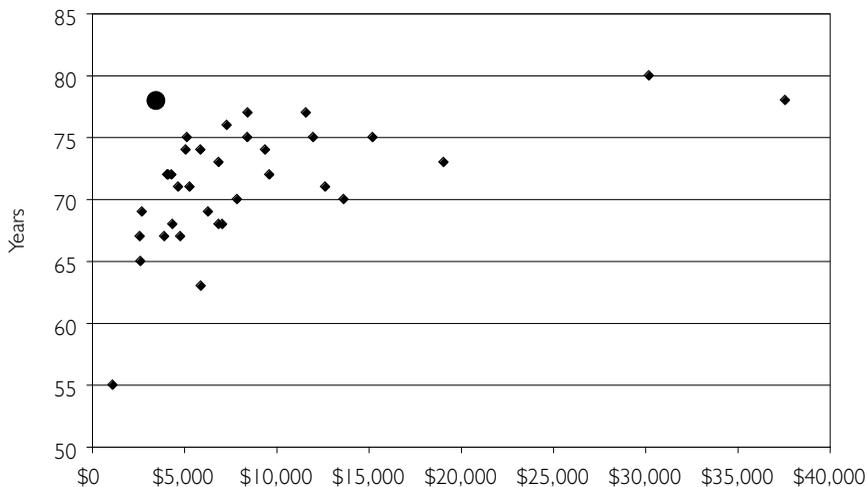
So what is happening in Cuba? "There has been remarkably little scholarship evaluating *how* this has been accomplished ..." (Spiegel and Yassi 2004). This column will not fill that gap. But there is one other remarkable feature of Cuban healthcare that does jump out of the WHR data.

Doctors and Good Health; No Clear Relationship, But ...

Cuba's doctor-to-population ratio – 5.91 per thousand – is by a substantial margin the highest in the world.³ Figures 3a and 3b show the reported physician-to-population ratios, for all countries and for those only of the Western hemisphere, plotted against per capita GDP. For countries with incomes under about \$10,000 there appears (in Figure 3a) to be a relationship between income levels and physician availability, branching out from a large concentration of countries that have neither money nor doctors. Above \$10,000, however, there is no clear relationship – the observations simply spray across the page.

There are many countries with a much greater physician supply than the United States or Canada, even with incomes well below \$10,000. But Cuba stands out at the upper left, far above the next highest, Belarus at 4.55, Belgium at 4.49 and Estonia at 4.48. There are a lot of doctors in Cuba.

FIGURE 2A. Life expectancy at birth plotted against GDP per capita, the Americas

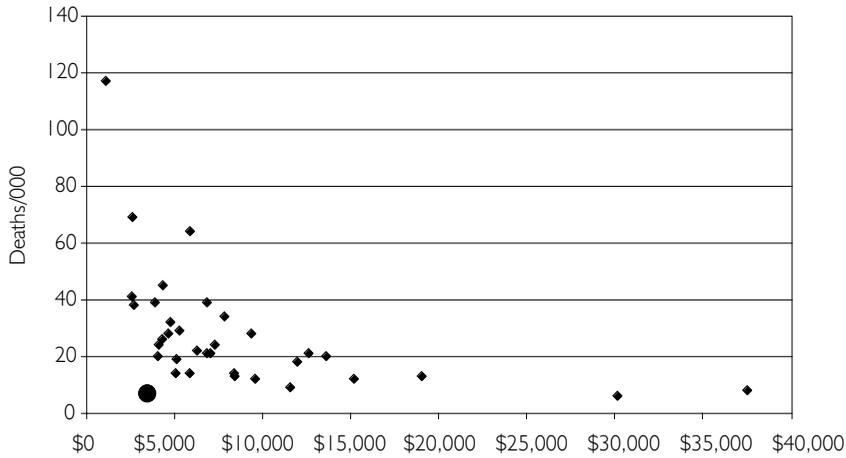


Source: WHO 2006, Statistical Annex, Tables 1 and 3.

Belgium and Belarus, however, make a convenient comparison, underlining the significance for health of the broader social context. Belgium's life expectancy, at 78, matches that of Cuba or the United States, and the under-five mortality of 5 is better than either Cuba (7) or the United States (8). Life expectancy in Belarus is a full 10 years shorter, and child mortality is exactly double that of Belgium. Estonia is between the two, at 72 and 8.

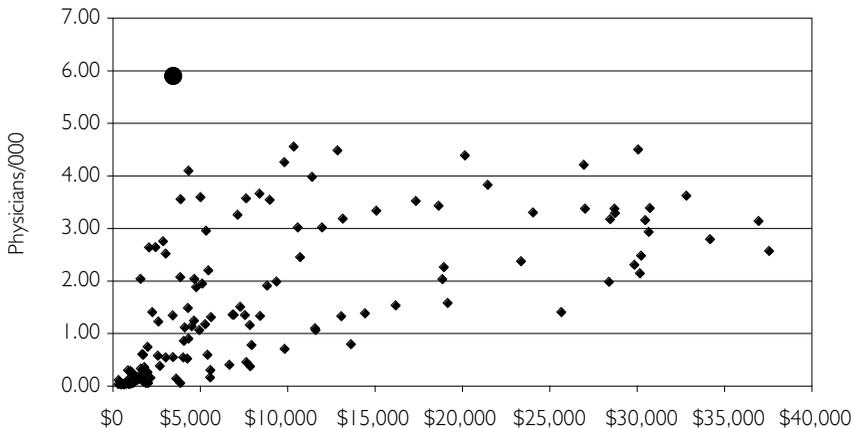
Canada, on the other hand, matches or exceeds the health outcomes of the most heavily doctored European countries – Italy and Greece, as well as Belgium – with half as many physicians. And Japan has fewer still (1.98 per thousand) and the best outcomes in the WHR.

FIGURE 2B. Mortality before age 5 plotted against GDP per capita, the Americas



Source: WHO 2006, Statistical Annex, Tables 1 and 3.

FIGURE 3A. Physicians per 1,000 population plotted against GDP per capita, 139 countries

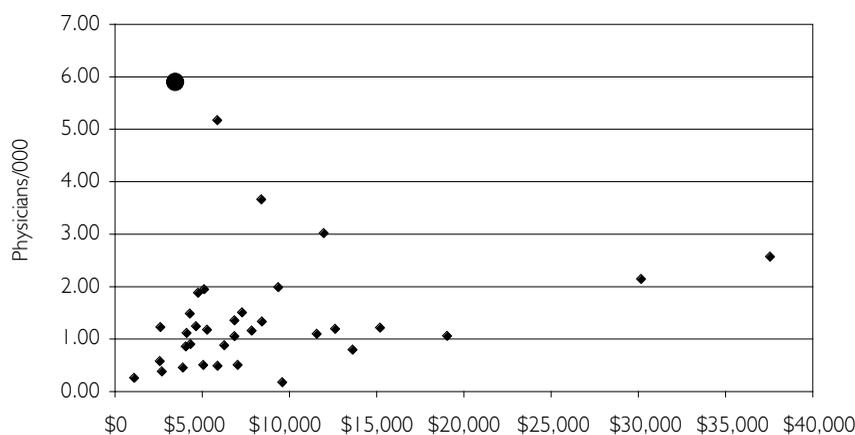


Source: WHO 2006, Statistical Annex, Tables 3 and 4.

A focus on the Americas alone, as in Figure 3b, may avoid some of the more extreme variations in culture and geography. But the tight clustering of American countries results from the presence of extreme outliers with respect to income (Canada and the United States) and physician supply (Cuba). There appears to be a slight positive relationship within the main cluster, but any statistical fit would be extremely sensitive to the inclusion or exclusion of outliers. There are, however, a handful of other countries besides Cuba that have relatively high physician-to-population ratios, without achieving comparable health outcomes (Table 1).

The other American states with particularly high physician availability show health outcomes markedly inferior to those in Cuba. The wealthy North American pair achieves results comparable to Cuba with many fewer physicians, but Mexico, with a physician supply not far below that in Canada, has significantly poorer outcomes. On the other hand, Chile, with about half as many physicians as Mexico or Canada, has health outcome measures comparable to the United States – and less than one-third the per capita income. That still amounts, however, to over three times the per capita income of Cuba.

FIGURE 3B. Physicians per 1,000 population plotted against GDP per capita, the Americas



Source: WHO 2006, Statistical Annex, Tables 3 and 4.

TABLE 1. Physician supply, life expectancy, mortality under age five and GDP per capita, the Americas

Country	Physicians per 1,000 population	Life expectancy at birth	Mortality under age 5	GDP per capita
Cuba	5.91	78	7	\$3,438
St. Lucia	5.17	74	14	\$5,880
Uruguay	3.65	75	14	\$8,408
Argentina	3.01	75	18	\$11,989
United States	2.54	78	8	\$37,572
Canada	2.14	80	6	\$30,192
Mexico	1.98	74	28	\$9,387
Chile	1.09	77	9	\$11,590

Source: WHO 2006, Statistical Annex, Tables 1 and 4.

Wealth and Health: Neither Necessary Nor Sufficient?

I promised above not to offer an explanation for the “Cuban Paradox,” but the combination of “first world” health statistics from a “third world” economic base, like the black swan, refutes “the conventional assumption that generating wealth is a fundamental precondition for improving health” (Spiegel and Yassi 2004). There is certainly a strong cross-national association between health and wealth over part of the income range, although the association disappears above relatively modest levels of average income. But there are alternatives; increased wealth is not a necessary condition for improved health, even among middle- and low middle-income countries.

Nor is it a sufficient condition. The strong relationship shown in Figures 1a and 1b covers a considerable degree of diversity in the middle-income ranges. Costa Rica, with a per capita GDP of \$8,438, has an average life expectancy of 77 years – just below the United States and Cuba. South Africa, with an income of \$7,964, has a life expectancy of 48 years. Kazakhstan (\$9,000) has a life expectancy of 61, while Thailand (\$7,879) and Brazil (\$7,855) have life expectancies of 70.

If McKeown was right – that increasing wealth is the highway to better health – a number of countries seem to have misplaced the map.

Conscious Political Will – and People Trained to Carry It Out

Szreter’s response to McKeown goes well beyond the epidemiology of tuberculosis. The much broader issue is the role of explicitly targeted social policy, of “an accompanying redistributive social philosophy and practical politics” (Szreter 2002) in the 19th century public health movement, simultaneously with the trends observed by McKeown. The revolution in population health over the last two centuries was not simply a side effect of a rising GDP, it was achieved through the deliberate intentions and actions of people with a social agenda. Any idea that “go for growth, and all else will be added unto you” would be a dangerous distortion of the historical reality.

The Cuban experience strongly supports the importance for population health of deliberate social action, of a very explicit focus not only on medical care but on the non-medical determinants of health: education, nutrition, housing, employment and social cohesion. Pursuit of such policies ultimately requires political determination, although in countries with other political regimes, increasing wealth may have been part of the process of mobilizing support.

But what about all those Cuban doctors?

Szreter appears to take a relatively benign view of McKeown’s “rhetorically powerful criti[que], from the inside, of the medical profession’s mid-20th-century love affair with curative and scientific medicine” (Szreter 2002). It is the dismissal of public health, broadly or narrowly interpreted, that he challenges, not the medical scepticism. But there is no medical scepticism in Cuba. Along with efforts to address a broad range

of non-medical determinants of health, Cuba has trained by far the world's largest supply of physicians per capita. Rather than seeing medical and non-medical determinants as competitive, Cuba has chosen, despite very limited resources, to go for both.

The difference appears to be that in Cuba, primary care physician (and nurse) teams have responsibility for the health of geographically defined populations, not merely of those patients who come in the door. These teams are then linked to community- and higher-level political organizations that both hold them accountable for the health of their populations and provide them with channels through which to influence the relevant non-medical determinants. To take on these roles, the *medico familiar integrable* (MFI) is trained in both the medical and the non-medical aspects of health.

Cuba has made operational the ideas sometimes described as "Community-Oriented Primary Care" (COPC) (Nutting 1984). The medical care system, rather than working in isolation from the non-medical determinants of health, becomes a key part of the process, the mechanisms of social intervention, through which those non-medical determinants are addressed. And the success or otherwise of those interventions is then reflected in the epidemiological data collected as part of the regular functioning of the medical care system. More doctors, but with broader training and scope, more responsibility and institutionalized access to political authority.

Research on population health has made great progress in elucidating the determinants of population health, but has been much less successful in identifying the levers for translating this understanding into specific policies. The Cubans appear to have re-focused and heavily resourced medicine to address the non-medical determinants as well. The split between population health and clinical medicine that traces back to McKeown may have deprived population health of one of the most powerful mechanisms for translating understanding into practice.

On the other hand, it is highly unlikely that the ideological framework of clinical medicine in high-income societies could ever have permitted such a relationship, nor that the broader political context could sustain it. Has anyone heard of COPC lately? Anyway, our societies are achieving average levels of population health that match or exceed Cuba's, albeit at more than 10 times the cost for healthcare. And if we preserve a pronounced social gradient in health, well, it could be worse. I'm all right, Jack.

ACKNOWLEDGEMENTS

With thanks to Nino Pagliccia and Jerry Spiegel.

NOTES

1. The WHR tables include 192 countries, but I have excluded several for which the WHR advises "caution" in the use of the data. I have also arbitrarily excluded

- “micro-states” with populations less than one million from the world figures but not from the Americas, leaving 139 and 35 data points, respectively.
2. A version of Figure 1b, fitted in double logs with country points scaled to relative populations and colour-coded by continent, has been prepared by Hans Rosling of the Karolinska Institute. It shows the outlier status of Cuba even more dramatically, but was beyond our technical competence to reproduce. Available on request.
 3. Actually, the highest ratio, 47.51, is in the Republic of San Marino – population 29,600 – but one has to suspect a tax haven. Coincidentally, according to the WHR, Canada and Cuba have virtually identical numbers of physicians (66,583 and 66,567), but Canada has only 2.14 physicians per capita.

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Sweet Nothings? The BC Conversation on Health

Mots tendres ? Consultations sur la santé, en Colombie-Britannique



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Abstract

On St. Valentine's Day 2006, the BC provincial government promised public discussions on healthcare. The ensuing Conversation on Health wrapped up last July. Meanwhile, the province has pursued more privately financed health construction projects (P3s) and tolerated expansion of the private healthcare subsector. The author reviews the differences between public consultation processes and the Conversation on Health, concluding that the principal aim of the BC government exercise was co-optation.

Résumé

Le jour de la Saint-Valentin, en 2006, le gouvernement de la Colombie-Britannique promettait des discussions publiques sur les services de santé. Les réunions intitulées « Conversation on Health » ont pris fin en juillet dernier. La province a mis en place plus de partenariats public-privé (PPP) pour des projets de construction liés à la santé

et a permis l'expansion du sous-secteur des services de santé privés. L'auteur compare les réunions « Conversation on Health » aux processus de consultation publique et conclut que la cooptation était le but principal de l'exercice du gouvernement de la Colombie-Britannique.

ON ST. VALENTINE'S DAY 2006, BRITISH COLUMBIA'S PROVINCIAL GOVERNMENT promised public discussions on healthcare. The short reference in the Throne Speech to a "province-wide conversation on health" followed two linked claims: (1) healthcare demand will inevitably rise because of the aging BC population and (2) the current level of public spending on healthcare services is not sustainable. The Throne Speech also announced an independent Foundation for Health Care Innovation and promised the premier would learn from systems that mix private with public healthcare financing by touring Europe (Government of BC 2006: 9). Thus, it was clear from the context not only what the government thought the problem was – excessive and rising public expenditure on healthcare – but also the solution: privately financed care supplementing or replacing publicly funded services. In short, an expanded private role in healthcare was to be the topic of conversation. In the end, however, the Conversation on Health provided fresh opportunity for those enamoured of universal, single-tier medicare to restate their case. Instead of *rapprochement*, a meeting of minds between government and its public, the Conversation illustrates the depth of the divide – a government from Mars and a public from Venus.

Given the tenor of the provincial government's Throne Speech, the September 28, 2006 formal launch of the Conversation on Health was met with cynicism. Reaction by the BC Health Coalition was typical: "We don't really trust this process because it appears that the premier has already decided we can't afford our public healthcare system and he intends to shape the debate around that view" (BC Health Coalition 2006). State-sponsored participation is rightly regarded with suspicion – a mechanism for manipulation and co-optation (Christiansen-Ruffman 1990). The risk of manipulation is particularly grave when the government's position has been unequivocally stated in advance of consultation. Even the opening question was a leading one: "Why are we so afraid to look at mixed health care delivery models?" (Government of BC 2006: 10).

Casting further doubt about the influence of public voices, the Speech from the Throne committed the government to act before hearing any of the conversation. The Throne Speech promised legislation enshrining the five principles of the federal *Canada Health Act* plus a new principle of sustainability. The target appears to be the federal government principle of accessibility, which is intended to preclude provincially authorized financial barriers to publicly funded health services. Sustainability, defined as "financial sustainability" of provincial healthcare financing, places limits on "free

access” whenever the pressure on the provincial treasury is judged by the provincial government to be too great. Unmentioned in the Throne Speech is the fact that British Columbia already has legislation enshrining the five principles of the *Canada Health Act*. The *BC Medicare Protection Act* was introduced by the New Democratic Party specifically to make it more difficult for subsequent BC governments to pursue private healthcare financing and delivery options. As the preamble puts it, “the people and government of British Columbia believe it to be fundamental that an individual’s access to necessary medical care be solely based on need and not on the individual’s ability to pay” (*Medicare Protection Act* 1996). Thus, the Campbell government’s commitment must mean either significantly amending or rescinding the *Medicare Protection Act*, presumably in order to permit private payment for hitherto guaranteed public health services. But nowhere does the government refer to this goal of user pay. Instead, the Throne Speech refers to “better access, greater choice, increased flexibility and new options” (Government of BC 2006: 11). Thus, it did seem disingenuous that the question: “How to strengthen the *Canada Health Act*?” was mandated for public discussion in the Conversation when the government had already unequivocally answered it.

Cynicism grew because both the BC government’s purpose and methods were, and remain, questionable. Why, for example, did the government think more consultation was necessary? Extensive public consultations occurred in British Columbia during the New Directions healthcare reform in the mid-1990s (Davidson 1999) and continue up to the present, albeit mainly at the micro-level of health programs and services, through the Regional Health Authorities’ Community Health Advisory Committees, patient focus groups and various ongoing regional and local public consultations (Vancouver Coastal 2006). Moreover, major public consultations on macro policy issues were conducted by the National Forum on Health in 1996 and the Commission on the Future of Health Care in Canada in 2002. The findings from those public consultations have been remarkably consistent. Canadians, including British Columbians, “want to keep the core principles of the Medicare model that accord with their strongly held values of universality, equal access, solidarity, and fairness” (Maxwell et.al 2002: vi). Among key themes from the recent Commission on the Future of Health Care rounds of consultation: (1) eliminating waste and improving management is only part of the solution; (2) primary care must incorporate more teamwork and improve coordination; (3) record keeping, communications and healthcare provider accountability must improve; (4) more funding is necessary; (5) additional funding should come from public sources, with increased taxes if necessary; (6) a parallel healthcare system ought not to be permitted; and (7) some private payment and market mechanisms may be appropriate as long as they are restricted to non-core/non-essential health services (Maxwell et al. 2002: vii). Subsequent national polling has yielded similar expressions of support for public funding of healthcare (“The Pollster Will See You Now” 2004).

Equally important is the question: How can consultation be meaningful and its results valid? "First, there must be a suspension of [government] action to create the political space for the deliberation to take place" (Rosenberg 2007: 340). This patently did not happen in British Columbia. Instead of a moratorium on healthcare change until the results of the Conversation were in, a premier fully satisfied that more private healthcare was workable and even desirable contributed to expansion of private healthcare. In light of the Throne Speech, the False Creek Surgical Centre, one of a number of private treatment clinics in the greater Vancouver area, decided to forge ahead with its plan to offer privately financed emergency and outpatient treatment services to walk-in clientele. Its owner wrote the government outlining his plans, and receiving no reply, assumed he was reading the signals correctly. When the clinic opened in late November 2006 to howls of protest, the government belatedly intervened. The private clinic reopened in April 2007 after recruiting doctors who were fully opted out of the provincial medicare plan and is currently operating unmolested by the Campbell government (Rolfson 2007).

Second, once political space is created, participants must be representative of the relevant population, the process inclusive and means deployed to force meaningful deliberation over values and options (Rosenberg 2007). The National Forum and the Commission on the Future of Health Care came close to meeting those requirements. The Citizens' Dialogue on the Future of Health Care, for example, employed random sampling, scenario construction supported by well-evidenced reports and, perhaps most importantly, design features that forced citizen participants to identify and make trade-offs as opposed to merely tabling observations and suggestions. The Conversation fell far short. Rather than a cross-section of citizens, participants were essentially self-selected. Once discussions were convened, no effort was made to confront differences in values or create a coherent vision of the healthcare system. Participants were free to render whatever comments and observations they had, essentially context-free, without consideration of trade-offs or opportunity costs.

Despite the lack of methodological rigour, the government's approach to consultation at least seemed fair from a procedural standpoint. The Conversation was designed to be open, with questions and issues posed by government but with allowance for citizens to suggest other matters for discussion (Ministry of Health 2007a). Features of the Conversation included a plan for 16 regional forums of 100 lay participants. (Professional healthcare providers were excluded, but paraprofessional and alternative healthcare providers were welcome.) Later, in reaction to criticism, the government added focus groups of professional healthcare providers.

However, public response, perhaps because of the background conditions, was muted. Out of British Columbia's over-19 population (3,339,470), a total of 4,586 (0.1372%) applied to attend the 16 forums (Statistics BC; personal communication BC Ministry of Health, April 27, 2007). Although the target size of each forum was

100 participants, only between 61 and 88 were actually recruited to the 11 forums held before May 1, 2007, with a mean attendance figure of 75 (Ministry of Health 2007b).

Participants were mailed a Regional Public Forum Participant Registration Package consisting of a letter from the minister of health and 11 “conversation starters.” The packages made clear the difference between what was envisaged in the Conversation and a citizen deliberative process. Citizen deliberation relies on balanced expert opinion with regard to technical issues and strategies, looking to citizens primarily for synthesis and consensus on normative dimensions (Abelson et al. 2003, 2007; Dryzek 2000). The conversation starters, in contrast, were deliberately one-sided and provocative. For example, starters feature highlighted text boxes with such content as, “Did you know in Sweden and France, patient cost-sharing and co-payments are required for many services, such as doctor’s visits, hospital care, medical devices and pharmaceuticals?” Those claims appear without context, explanation or reference. One starter, “About Seniors and Aging,” resorts to apocalyptic demography. Projections of growth in numbers of seniors are coupled with the statement “studies show that people in their 90s use approximately \$22,000 in health services each year – 10 times what people use on average in their 50s” (Ministry of Health 2007b).

Strangely, though, forum facilitators did not use the starters, indeed barely referred to them. The format of the regional forums, to the government’s credit, left participants free to suggest areas of discussion and to choose their own focus groups and topics. Government reports on regional forum discussions indicate participants set their own agenda and largely ignored the government’s resource material. Strong support for existing public programs is the common thread, along with recommendations for their expansion into more effective home care and drug programs (Ministry of Health 2007c). While many excellent ideas have been expressed for healthcare improvements, there has been little evidence of appetite for more healthcare privatization or private financing. This is scarcely surprising, as one would expect the supporters of medicare to mobilize against a government they regard as misguided, whereas those supporting the government no doubt believe it will travel its established course (Contrandriopoulos 2004).

At first glance, the Conversation is an example of British Columbia’s commitment to citizen deliberation. It is apparent that the BC government has been influenced by trends in California, the United Kingdom and elsewhere to use deliberative bodies to resolve policy issues. In fact, the province was briefly a leader in this regard when the Campbell government chose to use a citizen panel, the BC Citizens’ Assembly, to research and identify for government appropriate changes to the BC provincial electoral system. The government followed through by taking the Assembly’s recommendation to the general public in a 2005 referendum – a high point in BC democracy. Unfortunately, the Conversation, in contrast, marks something of a low point.

The complexity and expense, and the language of deliberation and consensus

building, imply the government must have been reaching for something beyond mere information seeking – not just “consultation” but some kind of “citizen participation” (Culyer 2005). However, while superficially deliberative, the Conversation’s eclectic mix of face-to-face discussions, electronically mediated communications and “conversation starters” were not designed to yield specific recommendations or even focus on any specific questions. The website and the minister’s letter to forum participants talked only vaguely about information gathering. Characterizing the activity as merely information gathering is accurate, because the Conversation is not any known form of citizen participation in policy formation – it does not fit the typology of citizens’ panel, deliberative polling, consensus conferencing, citizen’s jury or planning cell (Abelson et al. 2003; Pratchett 1999). That incongruity makes sense if and only if the Conversation is not about informing healthcare policy making.

If the Conversation is not about policy making, what could it conceivably be about, apart from a random collection of inputs? Government’s goals could be one or all of the following three possibilities: educative, socially integrative and co-optive. Educative goals could include helping citizens to see how complex and difficult healthcare policy decision-making can be or simply getting healthcare-related information in circulation. It is easy to see how either could diffuse resistance to unpopular policy. Socially integrative goals might include fostering democratic norms of debate and tolerance or, more fundamentally, transforming participants through their interaction with fellow citizens. Those are undoubtedly valuable things, but how they link to government’s healthcare agenda is unclear, except perhaps to diffuse dissent, which leads directly to co-optation. Essentially, co-optation boils down to using the Conversation as a cloaking and legitimating device for predetermined outcomes.

But all good romances involve mystery and surprises. Starting with this surprise: the government made good on reporting honestly the feedback it received through the Conversation. That feedback is the familiar National Forum and Romanow Commission refrain. “Most participants in the Conversation on Health argue for the maintenance of a fully publicly delivered and funded system” (Ministry of Health 2007d: 4). Favoured solutions are: publicly funded primary care centres, faster implementation of best practices and implementation of the Romanow Report recommendations (Ministry of Health 2007e: 7). The mysteries are, “What did government expect?” and “What will they make of the feedback, given their position as expressed in the Throne Speech?”

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Appel aux auteurs

DISCUSSION ET DÉBAT

La section « Discussion et débat » de *Politiques de Santé* offre un forum pour la publication de comptes rendus et de commentaires portant sur les sujets suivants : (1) d'importantes questions liées aux politiques de santé ou à la gestion du système de soins de santé; ou (2) des questions cruciales concernant les services de santé et la recherche sur les politiques. Les articles devraient être d'au plus 2 000 mots, sans compter les références (pas plus de 20). Les points saillants de l'article devraient être mis en évidence dans un résumé (sommaire) de 100 mots ou moins.

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Indicator Madness: A Cautionary Reflection on the Use of Indicators in Healthcare

La folie des indicateurs : Réflexion sur l'utilisation des indicateurs dans les services de santé



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Abstract

Indicators are increasingly being used to monitor and evaluate health system performance. However, although indicators can provide valuable information, they also have limitations. The benefits of indicators are vitiated when they are seriously flawed (unreliable, invalid or easily “gamed”), selected before the right question has been posed or used to the exclusion of other sources of information. This critical assessment of the use and misuse of indicators employs practical examples from a Canadian health

authority to illustrate common pitfalls. It concludes with some solutions to optimize the benefits of indicator use.

Résumé

On utilise de plus en plus les indicateurs pour évaluer et surveiller le rendement du système de santé. Bien que les indicateurs puissent offrir des informations valables, ils ont aussi leurs limites. Les avantages des indicateurs se trouvent altérés si ces derniers montrent de sérieuses lacunes (soit peu fiables, non valides ou facilement « manipulables »), s'ils sont choisis avant même de formuler les questions adéquates ou s'ils sont utilisés en exclusivité au détriment d'autres sources d'information. Cette évaluation critique de l'utilisation, adéquate ou erronée, d'indicateurs présente des exemples pratiques d'une autorité canadienne de la santé afin de signaler les pièges habituels. L'article se termine en proposant des solutions pour optimiser les avantages liés à l'utilisation d'indicateurs.

THE PAST TWO DECADES HAVE SEEN A GROWING INTEREST IN THE USE OF healthcare indicators to monitor and evaluate health system performance (Lilley 2000; Wait and Nolte 2005). This trend is not unique to healthcare but parallels a resurgence of interest in social indicators and performance measurement in general (Morris 1998) as governments respond to pressure to cut costs, make evidence-based decisions and be more accountable to the public (Baker et al. 1998). An indicator is a summary statistic used to give an indication of a construct that cannot be measured directly. For example, we cannot directly measure the quality of care, but we can measure particular processes (e.g., adherence to best practice guidelines) or outcomes (e.g., number of falls) thought to be related to quality of care. Health Canada has affirmed the value of national indicator reports in promoting informed decision-making (“allow[ing] governments ... to compare data, track changes, see progress and identify areas for improvement”) and enhancing public accountability (Health Canada 2006).

Obviously indicators can provide valuable information. However, in our enthusiasm for quantifiable results, it is easy to overlook the limitations both of particular indicators and of indicators in general. As the Canadian Institute for Health Information (CIHI) begins to release data on hospital quality and safety, it is perhaps appropriate to stand back and consider where the emphasis on indicators is taking us. Our observations are based on our experience working with decision-makers within a large urban health authority's Research and Evaluation Unit.

Getting the Right Answers

Not all indicators are created equal

Data derived from an indicator are only as good as the indicator that produced them. As the Alberta Heritage Foundation for Medical Research (1998: 5) noted:

Indicators should actually measure what they are intended to (validity); they should provide the same answer if measured by different people in similar circumstances (reliability); they should be able to measure change (sensitivity); and, they should reflect changes only in the situation concerned (specificity). In reality, these criteria are difficult to achieve, and indicators, at best, are indirect or partial measures of a complex situation.

Mainz (2003) has delineated a rigorous process for developing evidence-based indicators. Unfortunately, such guidelines are not always followed in practice. Often an indicator may be used simply “because it is there,” without consideration of its validity or robustness. In one provincial Community Health Assessment (CHA) planning process, participants identified over 200 indicators through a brainstorming activity, all of which were used – without the further step of applying the above criteria – in the next CHA.

An indicator’s limitations may not be obvious

Even well-established indicators are sometimes revealed to have serious flaws. For example, risk-adjusted mortality rates (such as the Hospital Standardized Mortality Rate, or HSMR) are widely used as an index of hospital safety. A systematic review of 18 relevant studies confirmed that on average, hospitals with exceptionally high risk-adjusted mortality rates do provide poorer care than hospitals with exceptionally low rates (Thomas and Hofer 1998). However, it concluded that such rates are too unreliable to draw conclusions about the quality of a particular hospital or the relative quality of two hospitals, as calculations are heavily subject to both systematic and random error.

Moreover, different indicators of quality may demonstrate no relationship with one another. Griffith et al. (2002) compared American hospitals on (a) the quality of various care processes, as assessed by the Joint Council on Accreditation of Healthcare Organizations and (b) several aggregate measures of care outcomes (e.g., adjusted mortality rate, complications). No significant correlations emerged among the different process measures, nor between the process and outcome measures. These results suggest that at least some of the most common measures of hospital quality are of dubious validity.

Indicators are often gameable

Another cause for concern is that many indicators are “gameable” – that is, staff can misrepresent the data. In a 2007 British Medical Association survey of emergency department staff, 31% of respondents reported that their department was manipulating data in order to meet wait time targets. Creative strategies included removing the wheels from trolleys in the ED to make them count as beds, and admitting inpatients via the ED to boost the proportion of patients seen in under four hours (Walley et al. 2006). Indicators that are perceived as unfair or inappropriate may not only encourage “gaming,” but also decrease confidence in indicators in general.

Even when there is no intent to “game,” changes in the way data are coded can produce illusory changes in the underlying construct. For example, Winnipeg’s Health Sciences Centre achieved a 40% reduction in its HSMR by rigorously applying national guidelines for coding palliative care patients. However, although the numbers improved, the actual mortality rate did not. This incident underscores the need for caution in interpreting indicators.

A poor indicator may be worse than no indicator

Although researchers and decision-makers would be ill advised to abandon indicators simply because they cannot be perfect, we must be mindful that incorrect information can be worse than no information at all. A poor indicator can identify a problem that is not there or fail to identify a problem that is there, providing false reassurance. For example, breastfeeding initiation is often used as an indicator of child health, as it is more easily measurable than breastfeeding duration. However, lack of clear coding guidelines, combined with pressure on facilities to increase breastfeeding rates, appear to have produced a definition of initiation as, “the mother opened her gown and tried.” Many nurses now express concern that the resulting high rates of breastfeeding initiation reported in many regions may serve as a barrier to needed action.

Asking the Right Questions

Evidence informed or data driven?

By focusing exclusively on indicators, decision-makers run the risk of being data driven rather than evidence informed (Bowen et al. 2007). It is very easy to respond to issues for which indicators are readily available, while ignoring potentially more important issues for which data are not available. This pitfall can privilege certain issues in the planning process. The tendency to focus on areas where data are most accessible calls to mind the Sufi fable of the man who lost a key in his house but searched for it under a nearby lamp post because there was more light there.

The tail wagging the dog

In some cases, decision-makers may consult indicators before they have a clear idea of what “key” they are looking for. Developing activities around “what existing data can tell us,” while a reasonable course for researchers, can be a dangerous road for decision-makers, who may lose sight of the real questions facing the healthcare system. Like the scientists in Douglas Adams’s novel *The Hitchhiker’s Guide to the Galaxy*, whose super-computer Deep Thought defined the meaning of life as “42,” they may need to recognize that knowing the answer is useful only when one knows the question.

In our observation, the phrase “we need a program evaluation” is often immediately followed by, “we have these indicators,” without consideration of exactly which question the indicators will answer. Such instances are not unique to healthcare. Evaluation expert Michael Patton (1997) has identified a widespread tendency for program staff to establish indicators before they know which underlying construct they wish to measure. Similarly, a report from Australia’s Bureau of Rural Sciences criticized “most efforts to date that attempt to develop indicators first, often leading to an unstructured shopping list The indicator-driven approach ‘puts the cart before the horse’ and often fails” (Chesson 2002: 2).

Working in the Right Context

Using indicators may not be cost effective

The collection and analysis of indicator data is not a neutral research exercise; on the contrary, it has significant organizational implications. Although the use of secondary data is commonly assumed to be a cost-effective quality monitoring strategy, this is not always the case. Responding to a poorly understood or inappropriate indicator may have significant resource implications. It can cause neglect of areas that “look OK” (even when practitioners know there is a problem) and result in significant resources being directed to areas where indicators suggest there is a problem. Even the cost of investigating a misleading indicator can be enormous. Significant regional resources were employed in investigating and responding to a recent report on patient safety indicators. While a few safety issues were identified, many other “indicators” were demonstrated (through audit and chart review of trigger cases) to reflect not safety but the effects of regionalization and some overzealous coding. Decision-makers may incur a significant opportunity cost when they use scarce resources for the number-crunching of unhelpful indicators rather than for interventions that would directly improve patient safety.

Indicators may be misunderstood

The meaning and calculation of indicators is often not transparent to users. As

Lemieux-Charles et al. (2003: 768) have noted, Canadian healthcare organizations “have tended to invest in information systems rather than in developing the analytic capability of their personnel.” Thus, the people who need to apply the results may be unable to fully understand them, let alone critique them. Even those decision-makers who have a gut sense that the data are “not right” may lack the epidemiological or statistical skills necessary to advance a critique.

Numbers are seductive

“Faith in numbers,” bolstered by the bias towards quantitative methods in healthcare, may blind users to methodological flaws or poor-quality data. In one working group reviewing drafts of a report using indicators, participants (who were well informed on the issue under review) were initially highly sceptical of the numbers, pointing out serious issues of data quality and availability. Even so, as they began to review the document, they were drawn into making comparisons based on the same data they had appropriately identified as limited.

Promoting, or closing down, critical debate?

Often, indicators are presented as the “gold standard” and providers who try to supplement the picture with contextual information are accused of being “in denial.” We have had occasion to hear versions of Berwick’s (2004) classic description of the stages of data-related denial misused to silence listeners’ legitimate concerns, and close down further exploration of what the numbers actually meant.

It is of course true that providers sometimes react defensively to data that are in fact correct. However, the message that whatever information healthcare professionals can share is of little relevance may result in an adversarial relationship between data suppliers and practitioners. As the challenges facing the healthcare system are complex, and require participation of all stakeholders, every effort must be made to ensure that the insights and experiences of practitioners are incorporated when data are interpreted.

Conclusion

Indicators are not going away – but they are not neutral, and they can contribute to poor planning decisions as easily as good ones. Researchers and decision-makers have a responsibility to use indicators in a responsible and thoughtful way.

What are the solutions?

- First, determine what you want to know.

- In selecting indicators, evaluate them for validity, robustness and transferability before proposing them. Don't use an indicator just "because it's there."
- Understand what the indicator is really telling you – and what it isn't.
- Limit the number of indicators, focusing resources on the strongest ones.
- Choose indicators that cannot be easily "gamed."
- Make indicator selection, development and interpretation a collaborative exercise: include and value the important contextual information and expertise that providers can bring.
- Treat indicators as one useful source of data, not a gold standard against which other evidence is measured. Integrate interpretation of indicators with program evaluation and qualitative research activities.
- Investigate areas where there is a discrepancy in data sources; this is where the greatest learning will occur.
- Most of all, remember that an indicator is just an indicator (Patton, 1997: 159). It is meant to be a "tool, screen, or flag" (CCHSA 1996) to assist in decision-making, not a driver for decisions.

By following these suggestions, researchers and decision-makers may truly realize the benefits of collecting and analyzing indicator data.

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Commentary: Indicators with a Purpose – Meaningful Performance Measurement and the Importance of Strategy

Commentaire : Les indicateurs et leurs
buts – mesure significative du rendement et
importance d'une stratégie



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Abstract

Sarah Bowen and Sara Kreindler argue that indicators can be valuable, but are also often flawed. They suggest that performance indicators should at best serve as a flag for policy makers but should not drive decisions. We would argue that there is growing evidence of the positive impact of performance indicators. When performance indicators are selected based on sound strategies – and used as part of a clear performance management cycle that balances policy instruments (e.g., accountability agreements) and

performance improvement processes (e.g., process redesign) – they can drive valuable performance improvements and help align strategies across all health system partners.

Résumé

Sarah Bowen et Sara Kreindler affirment que les indicateurs peuvent être valables, mais qu'ils sont souvent défectueux. Elles laissent entendre que les indicateurs du rendement devraient, au mieux, servir à attirer l'attention des responsables de politiques, mais pas à orienter les décisions. Or, nous estimons qu'il existe de plus en plus de données démontrant que les indicateurs du rendement ont un impact positif. Si les indicateurs sont choisis en fonction d'une stratégie bien articulée – et s'ils sont utilisés dans le cadre d'un cycle clair de gestion du rendement qui équilibre les instruments de politiques (c'est-à-dire les accords de responsabilité) et les processus d'amélioration du rendement (c'est-à-dire une nouvelle conception du processus) – ils peuvent mener à une amélioration appréciable du rendement et peuvent aider à harmoniser les stratégies entre les divers intervenants du système de santé.



BOWEN AND KREINDLER HAVE CRAFTED AN ENGAGING AND WELL-WRITTEN argument on some of the limitations of performance indicators in healthcare. In comparison to a number of other cautionary papers on indicators, they describe these limitations using practical examples but also acknowledge that all signs suggest indicators are here to stay. After documenting the challenges of working with decision-makers “who may lose sight of the real questions facing the healthcare system” and “who need to apply the results [but] may not be able to understand them,” they conclude that “an indicator is just an indicator.” It is meant to be a “tool, screen, or flag” (CCHSA 1996) to assist in decision-making, not a driver for decisions.” This pronouncement leaves decision-makers in a rather dismal situation.

It might help Bowen and Kreindler's critique to put in context the ways in which indicators are being used across North America today and to relate this use to emerging evidence on indicator development and the most effective application of indicators in measuring and improving performance.

How Are Decision-Makers Using Indicators?

Indicators are increasingly used as part of accountability agreements between those who fund care and those who organize or provide care. On their own, indicators can reflect increasingly important societal values such as transparency, accountability and fiscal responsibility. We can see clear examples of this in the United States, where

pay-for-performance based on indicators has become a remarkably common tool for performance improvement and increased accountability. But we can also see examples of this usage in Canada and the United Kingdom, where reporting and improvement with reference to performance indicators are an important part of contracts for services. In this case, indicators are at the core of a performance management cycle that includes strategy development (What are we trying to achieve?), articulation of goals (How will we know when we are successful?), resource allocation based on priorities (How can we link budget and goals?), assignment of responsibility (Who will deliver?) and the constant evaluation and improvement against those goals and redefinition of strategy (What can we do better, and what have we learned?). This performance management process is exemplified in Ontario, where the agreements between the Ministry of Health and Long-Term Care and the Local Health Integration Networks (LHINs) reflect all these steps.

As governments and their agents move increasingly towards the role of purchasers of services (Salamon 2002), they will require indicators to assess whether or not these services have been provided according to standards. As all healthcare systems confront the challenge of sustainability, they will also need to use indicators to ensure that tax dollars are producing value for money and to ensure that governments can report to the public on this value. It is unclear whether Bowen and Kreindler's advice is compatible with this use of indicators. Indeed, in many cases indicators will drive decisions about whether or not to renew contracts, to increase or reduce capacity at an institution, or to investigate threats to the public interest.

Where are indicators working well?

Bowen and Kreindler make good points about what can go wrong with indicators, but they pay little attention to situations where indicators have had a strong impact. There are now multiple examples where attention to performance reporting has paid substantial dividends, even with imperfect indicators. Bevan and Hood's (2006) paper on how performance reporting in the United Kingdom improved health outcomes, Ken Kizer's experience at the US Veterans' Health Administration, where he relentlessly measured performance against key goals (Asch et al. 2004) and even the Institute for Healthcare Improvement's (2004) 100,000 Lives Campaign have used indicators to motivate health providers to better performance. By focusing on the potentially negative outcomes of indicators, Bowen and Kreindler appear to be using a version of the precautionary principle to suggest that we should go cautiously because the potential risks are too great. They should balance this view with some form of appreciative inquiry and review the successful uses of indicators, where their public reporting and use in determining payments have been linked to improved screening rates, shorter wait times for care or safer healthcare.

How to Make Indicators Meaningful?

Bowen and Kreindler are right to argue against “indicator mania.” Simply producing numbers without any critical thought about what they mean or how they will be used is a recipe for wasting money at best and for making bad decisions at worst. However, over the past several years, attention has shifted away from questions about how to choose an indicator towards questions of how best to organize sets of indicators to reflect organizational goals and inform decision-making. Tools like the Balanced Scorecard are merely one reflection of a growing recognition that linking measurement to strategy is a critical element of getting measurement right. Here, we’d argue that Bowen and Kreindler don’t go far enough in some of their critique. If we don’t know what our strategy is, if we don’t know what’s most important in our healthcare system, then we shouldn’t start measuring things. In contrast, if we can lay out a simple strategy and measure what we are trying to do and what we want to achieve – the essence of a strategy-based approach to measurement – then we have a firm foundation for choosing where to invest our dollars in better measurement and for using indicators to anticipate problems in health system reform. Indicators based on clear strategies then have the potential to focus the attention of multiple stakeholders operating in complex systems on what really matters for the health sector, so that they adjust their strategies and support the achievement of broader health reform objectives.

Bowen and Kreindler are right – indicators are here to stay – but that is an argument for figuring out how to use them with all their warts and imperfections. Indicators will not improve until we start using them. All the advice in Bowen and Kreindler’s paper means that we have to be purposeful and clear about which indicators are important and then ensure that we invest in supporting their collection, analysis and use towards the broader goals of health system reform.

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The Authors Respond

Réponse des auteurs



by SARAH BOWEN AND SARA A. KREINDLER

Adalsteinn Brown and Jeremy Veillard have done an excellent job of outlining the gains that may be achieved from performance measurement, and the context for increased focus on this area. We do not suggest that indicators should not be used, or cannot be useful. We believe, however, that it is important to differentiate between the *efficacy* of indicators (their potential in ideal situations) and their *effectiveness* (what we see happening in actuality). The observation that the Veterans' Administration and Institute for Healthcare Improvement are using indicators in appropriate and helpful ways does not imply that every local health authority or hospital is doing the same. There remains a need for caution – not about the *fact* that indicators are used, but about the *way* they are used.

If the potential benefits of indicators are to be realized, we must address certain issues.

First, we must provide respectful space, such as that afforded in this journal, for productive discussion and debate, ensuring that all perspectives be heard. Also, we must put as much effort into developing capacity for understanding and interpreting

indicators as we put into generating them and promoting their use. (Some of our “caution” is rooted in our observation that those with the least awareness of how indicators are constructed often have the greatest faith in them.) We further agree that measurement must be linked to strategy; as we suggested, it is foolish to seek answers before one knows the questions.

Finally (and here we may diverge from Brown and Veillard’s position), it is essential to dispel the misconception that performance measurement is the only (or even the best) way to bring evidence into decision-making. Performance measurement is essentially an accountability mechanism, not a means of gathering all the information needed to support complex decisions. It can track short-term outcomes, but cannot determine why those outcomes occurred – was it the intervention, the way it was implemented, some other event, or random chance (Blalock 1999)? Even though certain analytic techniques, such as statistical process control, can pinpoint *when* a change occurred, discovering *why* is often less straightforward, especially when results are unexpected (see Bailie et al. 2006). In contrast, the broader enterprise of evaluation employs additional methods, a controlled research design or both to describe and also explain observations (Blalock 1999).

The healthcare system desperately needs to invest in more evaluation in order to answer fundamental questions: *Why* are we seeing these results? *Which* interventions will result in improvement? *How* can we best implement evidence-informed changes? Indicators can be valuable in promoting questions; they cannot be relied on to provide answers. Unfortunately, the concepts of performance measurement and evaluation are often conflated: decision-makers may believe that, if indicators are being monitored, no further evaluation activities are needed. Instead, indicator use should be but one component of a meaningful, multi-method evaluation strategy. Other appropriate sources of evidence must be integrated with indicator data – otherwise, the decisions we make will be dismal indeed.

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Using the National Population Health Survey to Identify Factors Associated with Patterns of Psychological Distress Over 10 Years

Définir les facteurs associés aux cycles d'épisodes de détresse sur une période de dix ans à l'aide de l'Enquête nationale sur la santé de la population



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Abstract

Objective: To use longitudinal data to group individuals based on their pattern of episodes of high distress, and to identify the socio-demographic correlates of these groups as well as their healthcare utilization.

Data Sources/Study Design: The National Population Health Survey (NPHS) was used to study 15,254 individuals over a period of 10 years from 1994/95 to 2004/05. We examined the socio-demographic correlates and healthcare utilization of different distress pattern groups.

Principal Findings: Significant differences between the no distress, single and multiple distress episode groups were observed on both socio-demographic characteristics and healthcare utilization.

Conclusions: Data about the same individuals over time provide better information than data collected at a single point in time. This information can be used to improve planning and provision of mental healthcare services.

Résumé

Objectif: Utiliser des données longitudinales pour regrouper des individus selon la tendance de leurs cycles d'épisodes de détresse aiguë, pour dégager des corrélats socio-démographiques au sein de ces groupes et pour connaître leur utilisation des services de santé.

Sources de données/conception de l'étude : L'Enquête nationale sur la santé de la population (ENSP) a suivi 15 254 individus sur une période de dix ans entre 1994-1995 et 2004-2005. Nous avons étudié les corrélats sociodémographiques et examiné l'utilisation des services de santé de divers groupes définis selon la tendance de leurs cycles d'épisodes de détresse.

Principaux résultats : Nous avons observé des différences significatives entre les divers groupes (sans épisode de détresse, avec un seul épisode de détresse, avec plusieurs épisodes de détresse) tant sur le plan des caractéristiques sociodémographiques que sur celui de l'utilisation des services de santé.

Conclusion : On obtient une meilleure information à partir de données portant sur les mêmes personnes pendant une période de temps qu'à partir de données recueillies de façon ponctuelle. Cette information peut être utilisée afin d'améliorer la planification et la prestation des services de santé mentale.

THE RELEASE OF THE SENATE REPORT ON MENTAL HEALTH IN CANADA (Kirby and Keon 2006) and the 2007 funding announcement of a National Mental Health Commission (Government of Canada 2007) have recently intensified the focus on mental health. According to the Canadian Community Health Survey, in 2002, 1.2 million Canadians had a major depressive episode, nearly 750,000 were affected by social anxiety disorder, 376,000 experienced panic disorder and 239,000 had a manic episode (Statistics Canada 2004). By the year 2030, unipolar depressive disorder is expected to be the leading contributor to disability-adjusted life years (DALYs), accounting for almost 10% of DALYs in high-income countries (Mathers and Loncar 2006).

Much mental health research has been based on the Canadian Community

Health Survey on the Mental Health and Well-being of Canadians, but few researchers have exploited the potential of the longitudinal National Population Health Survey (NPHS) (Tambay and Catlin 1995) to examine patterns of mental health and mental illness within the same individuals over time. Longitudinality is important because patterns of incidence, recurrence and chronicity of mental disorders, especially major depressive disorder and anxiety disorders, may characterize distinct subtypes of these diseases (DeMarco 2000; Angst et al. 2007). In turn, these subtypes may be associated with different risk factors, treatment options and patterns of healthcare utilization (Sareen et al. 2005; Rhodes and Fung 2004).

Psychological distress is a non-specific negative state of mental health, comprising symptoms of both depression and anxiety. Although distress is generally measured on a continuum, thresholds can be identified to indicate probable mental illness (Cairney et al. 2007; Kessler et al. 2002; Furukawa et al. 2003). This study utilizes 10 years of NPHS data to describe individuals who experience no, single and multiple observed episodes of high psychological distress over six periods of observation, and to describe their use of mental healthcare services.

Methods

This analysis is based on data from cycles 1 to 6 of the longitudinal National Population Health Survey (NPHS), conducted by Statistics Canada from 1994/1995 to 2004/2005 (Tambay 2005). Every two years since 1994/1995, the NPHS has collected data about health status, health behaviours and other determinants of health. This survey is representative of the household population in all provinces in 1994/1995, excluding members of the regular Canadian Forces and residents of Indian reserves, Crown lands, health institutions, some remote areas in Ontario and Quebec and Canadian Forces bases.

The response rate for the initial cycle was 86%, yielding 17,276 respondents. By 2004/2005, 32.9% of respondents had been lost to attrition. More detailed descriptions of the NPHS design, sample and interview procedures are available in other papers and reports (Tambay and Catlin 1995). This analysis is based on respondents aged 12 or older, resulting in a sample size of 15,254.

Distress was measured using respondents' scores on the K6, a psychological distress measure developed by Kessler et al. (2002), which has been used in numerous population-based surveys. The K6 measures distress through answers to six Likert-type questions scored from 0 to 4, which are summed to form a scale score with potential total scores ranging from 0 to 24. Questions refer to feelings such as nervousness or depressed mood *over the past month*, and include items such as "During the past month, ... about how often did you feel tired out for no good reason?" and "During the past month, ... about how often did you feel sad or depressed?" Based

on previous analyses comparing the K6 score to 12-month anxiety disorder or major depressive disorder, a score of 9 or more was considered to indicate high psychological distress and a possible mood or anxiety disorder (Orpana et al. in review).

Respondents were classified into three groups based on their patterns of distress over the six survey cycles. Those who had low distress scores (≤ 8) at each cycle in which they participated were assigned to the “no observed distress” group. Those who experienced a single episode of high distress (a score ≥ 9) were placed in the “single observed episode” group, and those who experienced two or more episodes of high distress were assigned to the “multiple observed episodes” group. Thus, respondents did not need to participate in each survey cycle to be included in the analysis.

Respondents’ sex, age group (12–18, 19–34, 35–54, 55 years and older), employment status, marital status, household income quintile, immigration status, province of residence and urban/rural status in 1994/1995 were used as co-variates. Whether respondents reported consulting a healthcare professional about their mental or emotional health in the past year, and how many times they had done so, were measured at each cycle.

Analysis

The proportion of respondents experiencing single and multiple observed episodes of high distress was computed, as was the proportion in each group (no distress, single observed episode, multiple observed episodes) consulting a health professional about their mental or emotional health in the past year. The mean number of contacts in the past year among those who did consult a health professional about their mental or emotional health was also computed. Because of the likely effect of currently experiencing high distress on the probability of having seen a health professional and on the number of visits, the analyses were stratified by whether respondents were experiencing high distress during a given cycle. The socio-demographic correlates of belonging to the single-episode or multiple-episode groups were analyzed using multinomial logistic regression in SUDAAN (2007), comparing the single- and multiple-episode groups to the no-episode group. Confidence intervals (CIs) were calculated using the bootstrap method (Rust and Rao 1996).

Results

While a large majority (81.4%) (95% CI 80.6–82.2) of the 1994/1995 cohort experienced no observed episodes of high distress over the six periods of follow-up, 11.1% (95% CI 11.1–12.4) experienced a single episode and 6.8% (95% CI 6.4–7.3) experienced multiple episodes of high distress. Based on these estimates, more than 1.6 million Canadians who were aged 12 and over in 1994/1995 experienced at least two

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episodes of high distress in the past 10 years, and almost three million more experienced at least one episode. Because distress was measured for only six one-month periods over the 10 years of the study, these estimates of the prevalence of distress are likely understated.

Women were almost 50% more likely than men to experience a single observed episode of distress and twice as likely to experience multiple observed episodes (Table 1). People younger than 55 were significantly more likely than those 55 or older to experience single and multiple episodes of distress. Compared with people who were married, single and previously married (widowed/divorced/separated) individuals were more likely to experience both single and multiple episodes of distress.

TABLE 1. Adjusted odds ratios relating socio-demographic characteristics to single and multiple observed episodes of high distress over 10 years, 1994/1995–2004/2005

Characteristic in 1994/1995	Single Adjusted OR (95% CI)	Multiple Adjusted OR (95% CI)
Sex		
Male [†]	1.00	1.00
Female	1.46* (1.26, 1.68)	2.00* (1.63, 2.45)
Age		
12 to 18	2.29* (1.61, 3.27)	1.85* (1.17, 2.92)
19 to 34	1.73* (1.33, 2.24)	2.37* (1.78, 3.17)
34 to 54	1.70* (1.37, 2.12)	2.52* (1.92, 3.31)
55 or older [†]	1.00	1.00
Employment status		
Employed [†]	1.00	1.00
Not currently working	1.45* (1.13, 1.86)	1.34 (0.94, 1.92)
Not working past 12 months	1.42* (1.16, 1.74)	1.60* (1.27, 2.02)
Marital status		
Married/living with a partner [†]	1.00	1.00
Single	1.32* (1.07, 1.63)	1.44* (1.12, 1.84)
Separated/Divorced/Widowed	1.28* (1.04, 1.56)	1.77* (1.36, 2.31)
Household income quintile		
Lowest income	1.61* (1.25, 2.06)	2.55* (1.77, 3.67)
Low–mid	1.54* (1.23, 1.92)	1.69* (1.17, 2.43)

TABLE 1. Continued

Middle income	1.15 (0.90, 1.46)	1.48* (1.05, 2.10)
Mid-high	1.20 (0.96, 1.49)	1.33 (0.92, 1.92)
Highest income [†]	1.00	1.00
Immigration status		
Born in Canada [†]	1.00	1.00
Immigrant to Canada	1.21* (1.01, 1.45)	0.98 (0.73, 1.31)
Region		
Atlantic	0.87 (0.74, 1.02)	1.00 (0.76, 1.32)
Quebec	1.31* (1.07, 1.61)	1.36* (1.08, 1.71)
Ontario [†]	1.00	1.00
Prairies	1.03 (0.85, 1.25)	0.95 (0.74, 1.21)
British Columbia	1.10 (0.87, 1.39)	0.85 (0.62, 1.17)
Rurality		
Urban [†]	1.00	1.00
Rural	0.87 (0.74, 1.02)	0.79 (0.62, 1.02)
Any missing cycle	0.95 (0.81, 1.11)	0.62* (0.50, 0.75)

[†] Reference category.

* Significantly different for estimate from reference category ($p < .05$).

Source: 1994/1995 to 2004/2005 National Population Health Survey, longitudinal health file.

A clear income gradient in the likelihood of experiencing distress emerged. For example, residents of households in the lowest income quintile were over twice as likely to experience multiple episodes of distress and more than 50% more likely to experience a single episode, compared with people in the highest income quintile. Compared with employed people, those who had not worked in the past 12 months, or who had worked during that time but were not currently working, were significantly more likely to experience a single episode of distress. Only those who had not worked in the past 12 months were significantly more likely to experience multiple episodes of distress.

Immigrants were marginally more likely to experience a single, but not multiple, episode of high distress than were people born in Canada. No differences were observed between urban and rural residents. However, Quebec residents were 31% more likely to experience a single episode of distress, and 36% more likely to experience multiple episodes, than were Ontario residents. No other significant regional differences were observed.

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A relatively low proportion of individuals in the no-episodes group reported having consulted a health professional for mental or emotional health reasons at each of the six cycles; approximately 5% of them had used such a resource during the previous year (Table 2), with an average of close to seven visits. In contrast, even when not distressed, 15% of individuals in the multiple-episodes group consulted a health professional about their mental health, with significantly more visits than those who were never distressed (10.1 vs. 6.6 visits). During cycles when they reported high distress, 35% of the multiple-episode group reported consulting a mental healthcare professional, with an average of over 14 visits.

TABLE 2. Percentage consulting a health professional about mental/emotional health and average number of contacts[†] in the past year, by distress group and current distress (data pooled over 6 cycles)

	Not distressed			Distressed		
	%	Mean visits	(SE)	%	Mean visits	(SE)
Never distressed	5	6.6	0.5	n/a	n/a	n/a
Single episode	11	7.2	0.6	26	10.5	1.0
Multiple episodes	15	10.1	0.9	35	14.2	1.0

[†] Of those reporting consultation.

SE – Standard error.

n/a – Not applicable.

Source: 1994/1995 to 2004/2005 National Population Health Survey, longitudinal health file.

For those in the single-episode group who reported high distress at a given cycle, the proportion consulting a healthcare professional was 26%, and the average number of times they had done so was over 10. Not surprisingly, for both the single- and multiple-episode groups, the mean number of visits was significantly higher during cycles when they were experiencing high distress.

Discussion

Over the 10-year period from 1994/1995 to 2004/2005, the vast majority of Canadians studied did not experience an observed episode of high distress. However, an important number experienced single or multiple episodes of distress at levels likely to be clinically relevant (Cairney et al. 2007; Orpana et al. in review). Certain characteristics, such as being female, younger or previously married, as well as having low income and not being employed, were associated with a higher likelihood of experiencing either single or multiple episodes of high distress.

With respect to mental healthcare utilization, it is clear that those in the multiple-episodes group are higher users of mental healthcare services, even during periods

when they are not experiencing high distress. This finding may indicate that this group has more chronic mental health problems that require ongoing contact with mental health professionals. However, the findings also reveal a large unmet need for mental healthcare: 65% of the multiple-episode group and 75% of the single-episode group who had experienced high distress during the previous month had not consulted a health professional about their mental or emotional health during the past year. This finding is similar to the estimated 64% of individuals in the United States whose level of psychological distress indicates probable serious mental illness, but who do not have contact with a mental healthcare professional (Mojtabai 2005).

The primary limitations of this study are the time of measurement and respondent attrition. Because the distress measure in the NPHS refers to the past month, the identification of respondents who experienced high distress reflects six one-month periods of observation over 10 years. It is probable that some respondents experienced high distress at times when they were not observed. However, because six observations were used to categorize respondents into distress pattern groups, these groups reflect a richer gathering of information than would have occurred with a cross-sectional study. The prevalences reported cannot be interpreted to reflect the prevalence of experiencing high distress over 10 years, but should be interpreted as the prevalence of experiencing high distress one or more times during six one-month observation periods. The differences in socio-demographic characteristics and in mental healthcare use between those experiencing no, single or multiple episodes of distress indicate that this classification has some degree of validity.

Differential respondent attrition could also bias the results, especially because missing one or more cycles decreases the chances of observing an episode of high distress, and because distress may be related to being a missing respondent. While those who had missed one or more cycles were no less likely than those who missed none to be classified in the single-episode group, they were only 64% as likely to be classified in the multiple-episode group. However, including a variable indicating whether a respondent missed none versus any cycles did not change the relationships between socio-demographic correlates and group membership.

Despite these limitations, the use of the K6 psychological distress scale in this longitudinal study demonstrates the usefulness of multiple measurements of the same individuals over a long period of time in clarifying patterns and correlates of mental health problems. Further research should investigate more fully the subtypes of patterns of psychological distress and their predictors, including how changes to these predictors affect patterns of distress. Moreover, characteristics of distressed individuals who do not have contact with a mental healthcare professional should be explored further in order to identify vulnerable subgroups. Given the number of people who experienced episodes of high distress over a 10-year period, such findings may help to improve the mental health of a sizable number of Canadians.

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ONLINE EXCLUSIVES**Analysis of International Migration Patterns Affecting Physician Supply in Canada****Analyse des schémas de migration internationale et de leur influence sur la disponibilité de médecins au Canada**

MAMORU WATANABE, MELANIE COMEAU AND LYNDA BUSKE

Abstract

This paper analyzes the migration patterns of both Canadian medical school graduates and international medical graduates (IMGs), and the impact of these patterns on physician supply in Canada. Immigration patterns of IMGs have changed over time, with fewer physicians from the United Kingdom and more from South Africa. A large portion of IMGs who leave Canada (43%) return “home.” Recently, the average duration of practice in Canada for these doctors has been three years, a finding that suggests many came for educational purposes or to acquire skills. The heterogeneity and complexity of international migration are highlighted in this paper.

Résumé

Cet article analyse les schémas de migration des diplômés en médecine d'écoles canadiennes et de ceux venant de l'étranger, et étudie l'impact de ces schémas sur la disponibilité de médecins au Canada. Les schémas d'immigration des diplômés de l'étranger se sont modifiés au cours des années : moins de médecins proviennent du Royaume-Uni et plus viennent de l'Afrique du Sud. Une grande part des diplômés de l'étranger quittent le Canada (43 %) pour retourner au pays où ils ont obtenu leur diplôme. Récemment, le temps moyen de pratique au Canada pour ces médecins était de trois ans, donnée qui suggère que plusieurs d'entre eux sont venus pour obtenir une formation ou acquérir des compétences. L'hétérogénéité et la complexité de la migration internationale sont mis en relief dans l'article.

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Improving Drug Benefits for Children with Asthma: Results of a Multi- stakeholder Workshop to Build a Research Agenda

Amélioration des régimes d'assurance
médicaments pour enfants atteints d'asthme :
résultats d'un atelier multipartite pour définir
un programme de recherche



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Improving Drug Benefits for Children with Asthma

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Abstract

Asthma is the most common chronic childhood disease, and evidence suggests that children underutilize inhaled corticosteroid (“controller”) medications. Drug plans that provide benefits to children vary widely across Canada, and families may face high out-of-pocket costs. As an initial step in a knowledge exchange process aimed at motivating relevant research, a workshop was convened in March 2007 with diverse stakeholders to explore potential research topics within the theme of improving drug benefits for Canadian children with asthma. Six key challenges for further investigation were identified: (1) changing the perception of asthma from an episodic to a chronic disease, (2) improving diagnosis and management, (3) increasing intersectoral communication, (4) improving the quality of data, (5) developing better drug benefit plans and (6) practising more effective advocacy.

Résumé

L’asthme est la maladie chronique la plus répandue chez les enfants. Les données indiquent une sous-utilisation, chez les enfants, des médicaments corticostéroïdes inhalés (de « contrôle »). Les divers régimes d’assurance médicaments au Canada présentent une grande variété quant aux avantages pour les enfants. Dans certains cas, les familles doivent parfois déboursier des sommes considérables. Afin d’entamer un processus d’échange de connaissances visant à stimuler une recherche pertinente, un atelier, qui a eu lieu en mars 2007, réunissait diverses parties prenantes qui ont réfléchi aux sujets de recherche potentiels touchant à l’amélioration des prestations pharmaceutiques pour les enfants canadiens atteints d’asthme. Six domaines de recherche principaux ont été cernés : (1) reconsidérer le statut de l’asthme pour en faire une maladie chronique au lieu d’épisodique, (2) optimiser le diagnostic et la gestion de la maladie, (3) améliorer les communications intersectorielles, (4) enrichir la qualité des données, (5) concevoir de meilleurs régimes d’assurance médicaments, et (6) effectuer une meilleure sensibilisation.

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PAEDIATRIC ASTHMA IS THE MOST COMMON CHRONIC DISEASE OF CHILDHOOD. Prevalence and morbidity have increased over the past 30 years in Canada, the United States, the United Kingdom, Australia and New Zealand. Asthma affects between 10%–18% of Canadian children and varies by region (Millar and Hill 1998; Lava and Moore 1998). Proper management of asthma requires treatment with inhaled corticosteroid (“controller”) medications, which have been reported to be underutilized by children (Rabe et al. 2004; Finkelstein et al. 2002). Asthmatic children also benefit from spacers for optimal inhaler use and peak flow meters for self-monitoring (Becker et al. 2005; GINA 2006), yet these devices are not typically covered by public drug plans (Ungar and Witkos 2005). Canadian children’s access to asthma medications varies as a function of drug plan availability and medication costs (Health Canada 2000; Kozyrskyj et al. 2001; Ungar and Witkos 2005). Achieving optimal control is complicated by the fact that the drugs most needed for daily control of airway inflammation, inhaled corticosteroids, are among the most costly while “as needed” drugs, the short-acting beta2-agonists, are inexpensive with numerous generic equivalents available. In provinces such as Ontario, asthma medications and devices are not universally available to children through provincial plans.

High prices, insurance deductibles and high co-payments deter regular use of costly daily controller medications (Ungar et al. 2008). In most Maritime provinces, low-income families may face expenditures of up to 7% of household income to pay for one child’s asthma medications, compared to 0% in Quebec, Alberta and the Yukon (Ungar and Witkos 2005). While Canada’s National Pharmaceuticals Strategy looks at broad national issues including catastrophic drug coverage, the strategy does not focus on specific drug classes or highly prevalent conditions. No attention has been paid at the federal level to ensure provincial standards of benefits for vulnerable populations, such as children and low-income families.

The KT Initiative

Knowledge transfer (KT) is a multi-stage process that begins with articulating a health policy concern, in this case, improving benefits to Canadian children with asthma, identifying a range of interested stakeholders who share this concern and bringing these diverse stakeholders together in a forum that promotes an exchange of knowledge, experience and ideas. A KT initiative that brings diverse stakeholders together to inform a research agenda has been successfully implemented in the field of asthma and other therapeutic areas (Strunk et al. 2002; Masotti et al. 2007), to examine disparities in provision of health services to patients with asthma (Weiss 2007) and in prevention, diagnosis and treatment of cancer (Krieger et al. 2005), and to promote health safety (Health Canada 2006). The initiative described here includes these preliminary steps. Future stages will consist of systematically compiling available evidence

to support the pursuit of particular research questions that arise from the discussions, conducting relevant research and ultimately transferring research findings back to stakeholders, health practitioners and policy makers.

Professional groups and organizations having an interest in children and asthma were identified in various communities, including healthcare provision, healthcare decision-making and research. Leaders and those in senior positions were invited to participate in a workshop aimed at identifying research opportunities related to improving drug benefits for Canadian children with asthma. The workshop, held on the evening of March 27 and all day March 28, 2007 in Toronto, Ontario, brought together 30 participants including family doctors, allergic disease and respiratory paediatric specialists, pharmacists, health system administrators, provincial drug benefit policy makers, private drug benefit managers, patient representatives, asthma educators, patient and professional advocacy group representatives, parents, pharmaceutical policy experts, knowledge transfer experts, healthcare researchers and research trainees.

The primary objectives of the workshop were to (1) identify factors that affect children's access to asthma medications, devices and education and (2) identify and prioritize issues related to improving drug benefits for children with asthma that could inform future research. In addition, the workshop gave attendees an opportunity to learn about developments in asthma management from leading researchers; learn about provincial approaches to the provision of drug benefits to children across Canada; share cross-sectoral interests, challenges, experience and expertise in the management of paediatric asthma; identify future research needs and opportunities related to paediatric asthma health policy; and facilitate the development of a multisectoral, multidisciplinary, Canadian network of experts who share an interest in paediatric asthma health policy.

A context for small group discussions was set through a combination of expert presentations and interactive discussion. Presentations covered the significance of paediatric asthma as a health policy challenge (Dr. Wendy Ungar, University of Toronto/The Hospital for Sick Children); challenges facing researchers aiming to translate their findings into policy (Dr. Anita Kozyrskyj, University of Manitoba); strategies researchers can use to make a positive impact on policy decisions (Dr. Cameron Mustard, Institute for Work and Health); and an overview of recent research on childhood asthma control (Dr. Allan Becker, University of Manitoba). A multi-province panel discussion (Ontario, British Columbia, Manitoba and Quebec) compared provincial approaches to public drug benefit programs for children.

In the morning session, participants worked in three small groups to identify factors influencing children's ability to obtain access to the medications, devices and education they need for optimal asthma control related to (1) drug plan benefits and policies, (2) the provision of healthcare to children and (3) demographics, socio-economic status, family resources and parental health beliefs and behaviours. In the afternoon

session, the same groups convened to discuss and prioritize strategies that could be pursued by (1) private and public drug plan managers, (2) health professionals and (3) patient advocacy groups, parents, community agencies, schools and local governments.

Results of the KT Experience

Through analysis of the small- and large-group presentations and discussions, six overarching challenges were identified, which if addressed through research programs that generate evidence, would make a significant impact. These challenges and the specific points supporting them are described below.

Challenge #1: Change the perception of asthma

Asthma must be recognized and treated as a chronic disease. Three issues related to this challenge were identified:

- Asthma diagnosis is hard for parents and children to accept.
- Expectations of patients and their families regarding stigmatization must be anticipated.
- While the health system is well organized to provide acute care for children with asthma, it places less emphasis on long-term secondary prevention and management of asthma as a chronic disorder. A chronic disease management strategy for education and treatment is needed.

The perceptions of parents and the reluctance of some to accept their child's asthma as a condition requiring ongoing attention has been documented (Lauritzen 2004; Peterson-Sweeney et al. 2003). Education as well as enhanced communication between parent and provider can help improve parents' abilities to manage their child's condition (Kolbe 1999).

Challenge #2: Improve the diagnosis and management of paediatric asthma by healthcare providers

- Respiratory disease does not have a high profile among primary care practitioners.
- Better training and education about asthma as a chronic disease is needed among a wide range of healthcare professionals.
- Better assessment tools are needed for asthma diagnosis, especially in young children.
- Doctors are not paid to provide asthma education and may not perceive patient and family education as an essential component of asthma management.

- Access to primary care providers is restricted in urgent situations.
- Access to Certified Asthma Educators is limited.
- Continuity of care from setting to setting and from childhood to adulthood is inadequate.
- Healthcare practice would benefit from bottom-up pressure from parents to obtain the proper diagnosis and treatment for their children.
- Practitioners must consider socio-economic factors and families' financial resources in approaching asthma management and medication use.

While excellent clinical guidelines are available for the management of asthma by primary care providers (Becker et al. 2005), provider knowledge of and adherence to guidelines have been shown to remain issues (Chapman et al. 2001; Cloutier et al. 2006; Cabana et al. 2000). The guidelines are principally aimed at physicians, whereas asthma educators and pharmacists play critical roles in asthma management (McLean et al. 2003).

Challenge #3: Increase and improve intersectoral communication

- Regular networking is needed among healthcare providers, policy makers, researchers and parents.
- Asthma Action Plans are tools that a range of care providers can use to improve communication between health professionals and parents and their children.

Challenge #4: Improve the quality of data and evidence

- There is untapped potential to track and study prescription patterns (e.g., electronic prescriptions).
- Provincial ministries of health should consider the effects of drug-related benefits on the utilization of non-pharmaceutical health services.
- Means should be created within the health system to track asthma-related health resource use – hospitalization, drugs and physician services – and establish alerts where unnecessary services or expenses occur.
- Few employers track absenteeism. Data on absenteeism related to burden of care-giving attributable to paediatric asthma are needed.
- Drug manufacturers need to do more clinical trials of paediatric asthma medications with relevant comparators and consider safety, formulation, device and administration issues specific to children.

Challenge #5: Develop better drug benefit plans

- Listing decisions should be part of an asthma risk management strategy rather than based on the clinical benefit of individual drugs.
- There is a need for an education component in drug benefit plans.
- Payers and pharmacy benefits managers need to devise plans that include incentives for patients and caregivers to change behaviour and follow a chronic disease management strategy.
- Lack of generic drugs (e.g., for inhaled corticosteroids) is an issue in Canada; brand-name drugs are costly.
- Incentives should be created to allow more generics into the marketplace, especially for asthma drugs that combine multiple medications within a single inhaler device.
- Drug costs are a problem for the working poor and the not-so-poor with multiple asthmatic children.
- Many drug plans don't cover devices, e.g., spacers and peak-flow meters, which enhance delivery of medication and self-management (GINA 2006).

A trend has arisen in the United States and Canada to increase cost-sharing by subscribers as private and government drug plans raise deductibles and co-payments that families pay out of pocket (Tamblyn et al. 2001; Crown et al. 2004; Stevens et al. 2003). There has been very little scrutiny of the impact of these trends on health outcomes in children.

Challenge #6: Practise effective advocacy

- The image and understanding of asthma need to be re-profiled with patients, care providers and payers.
- Advocacy is needed to raise awareness and funding for asthma research, services and education.
- Susceptible, vulnerable subgroups of children with asthma may require a different advocacy focus.
- Health researchers must advocate for population-based databases of all prescriptions dispensed to children, linking private and public sector data.
- World Asthma Day and other high-profile events, such as charity walks or runs, can help create a wider awareness about asthma.
- The trajectory of health suggests that maintaining good health during childhood can lead to better health in adult years. This point should be stressed in advocacy efforts.

Lessons Learned

The process of selecting key individuals across a wide range of stakeholders who share a common health policy interest and bringing them together in a roundtable forum to share experience, knowledge and perceptions proved to be an extremely useful approach in motivating and informing a research agenda. Workshop participants identified a number of specific strategies that could be pursued to improve drug benefits for children with asthma.

Private and public drug plan managers could

1. assess and reduce inappropriate medication utilization;
2. integrate asthma education into drug plan benefits;
3. share and learn from experiences of plans in other jurisdictions; and
4. move forward on a national consensus regarding a Canada-wide drug plan design.

Health professionals could

1. develop a new chronic disease management model for paediatric asthma, emphasizing secondary prevention;
2. define and address the barriers to obtaining drug benefits; and
3. develop and implement behaviour change strategies for health professionals to improve practice.

Patient advocacy groups, parents, community agencies, schools and local governments could

1. promote asthma education programs;
2. promote use of technology in drug administration and adherence, self-efficacy, learning and communication;
3. develop intersectoral links;
4. improve asthma management in schools; and
5. stay informed regarding existing and planned initiatives in lung health and child health Canada-wide.

From an analysis of the discussion of the strategies, several research opportunities were revealed, including:

- comparisons of provincial initiatives and appraisals of the strengths and weaknesses of provincial drug benefit plans; comparisons of patient outcomes such as medication use and urgent health services use in provinces with special programs or policy changes to those in provinces without such initiatives;

- investigation of the phenomenon of private plans imitating public plans in a private/public mixed plan jurisdiction;
- an analysis of social, financial, cultural and other barriers to improving drug benefits for children with asthma across settings;
- documentation of paediatric asthma prescription and adherence patterns, the reasons for and opportunity costs of suboptimal paediatric asthma medication utilization and prescribing;
- evaluation of paediatric asthma diagnostic and control assessment tools for very young children;
- clinical trials of paediatric asthma medications with relevant comparators;
- studies of drug safety considerations specific to children, including pharmacogenomics;
- identification of incentives and behaviour change strategies that would motivate healthcare providers to (1) incorporate patient education at the point of care/dispatching, (2) adopt a chronic disease management approach that emphasizes secondary prevention and (3) improve the continuity of care;
- evaluations of mechanisms to integrate asthma education into drug benefit plans.

Next steps require assembling academic teams to consider each of the suggested research topics and conduct comprehensive and systematic reviews of the evidence. Workshop participants suggested that future research projects be pursued by academic teams in collaboration and/or consultation with primary care providers, paediatric specialists in respiratory and allergic disease, pharmacists, asthma educators, patient/parent representatives, policy makers, insurers and drug benefit managers (public and private), pharmaceutical company representatives, health system administrators and knowledge translation experts.

Conclusions and Implications

According to participants' evaluations, the workshop was successful in bringing together disparate groups of professionals and community members to focus on a particular public health issue in paediatrics. There was significant mutual learning and inspiration, and a collaborative tone was maintained throughout. In addition to suggesting research topics, participants provided a number of suggestions to promote the translation and uptake of future research findings. These included strengthening relationships between researchers and stakeholder organizations, facilitating patient-centred communication, increasing public awareness of asthma as a chronic disease and promoting secondary prevention and optimal management strategies.

Expected outcomes of this workshop include increased cross-sectoral networking and the identification of a broad, multisectoral research team to facilitate the development of high-impact, policy-relevant research that can be supported within the AllerGen research program, by the Canadian Institutes of Health Research (CIHR) and by other funding agencies. One of the enduring benefits of this event was setting a successful precedent for networking and relationship-building among diverse stakeholders and experts who share an interest in improving outcomes for children with asthma.

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Evidence Boost for Quality: Visiting-Specialist Services to Improve Access and Outcomes for Isolated Populations

Données à l'appui : Des services spécialisés itinérants pour améliorer l'accès aux soins et l'état de santé des collectivités isolées



by CANADIAN HEALTH SERVICES RESEARCH FOUNDATION

Abstract

People living in rural and remote communities often have among the greatest health needs but the most limited access to healthcare services, including specialist care. One solution for increasing access to specialist services is visiting-specialist services or specialist outreach clinics – that is, planned, regular visits by specialist physicians from their usual practice location to see patients in primary care or rural hospital settings. The evidence behind visiting-specialist services was recently summarized in *Evidence Boost for Quality*, a special subseries of *Evidence Boost*, produced by the Canadian Health Services Research Foundation to showcase healthcare issues where research indicates a preferred course of action in health services management and policy. To access archived issues of *Evidence Boost*, visit http://www.chsrf.ca/mythbusters/eb_e.php.

Résumé

Les collectivités rurales ou éloignées ont des besoins en matière de santé souvent criants, mais l'accès aux services de santé, notamment aux soins spécialisés, y est très restreint. Le programme de spécialistes itinérants ou la clinique d'extension des services spécialisés peut contribuer à régler ce problème. Le programme ou la clinique prévoit que des médecins spécialistes se rendent à intervalles réguliers dans les milieux de première ligne en régions rurales. Les données probantes sur le programme ont été résumées dans un numéro spécial de *Données à l'appui, Données à l'appui pour la qualité*, produit récemment par la Fondation canadienne de la recherche sur les services de santé pour faire connaître les aspects des services de santé où la recherche indique un plan d'action prometteur pour la gestion et les politiques en matière de services de santé. Pour consulter les anciens numéros de *Données à l'appui*, veuillez visiter le http://www.chsrf.ca/mythbusters/eb_f.php.

PEOPLE LIVING IN RURAL AND REMOTE COMMUNITIES OFTEN HAVE AMONG the greatest health needs (WHO 1995) but the most limited access to health-care services, including specialist care (Gruen et al. 2006). This is commonly referred to as the “inverse care law,” where the availability of medical care is inversely related to the needs of the population (Tudor 1971). For example, while rural Canada makes up the majority (99.8%) of terrain and is home to roughly 20% (nine million) of Canadians (Beshiri et al. 2001), only about 16% of family physicians and 2% of specialists have practices in these areas (CIHI 2006).

Rural family physicians often shoulder a heavy workload in these areas (Wootton 2007), made more difficult by lack of access to specialist services for their patients (Telford et al. 2002). One solution for increasing access to specialist services is visiting-specialist services or specialist outreach clinics (Gruen et al. 2004, 2006) – planned, regular visits by specialist physicians from their usual practice location (usually hospitals or their own private offices in urban areas) to see patients in primary care or rural hospital settings (Gruen et al. 2004). These clinics can improve access to specialty care and health outcomes for patients — especially disadvantaged groups, since access barriers have important health consequences — while also improving collaboration between primary caregivers and specialists (Gruen et al. 2004).

Strategy for Change

Specialist outreach clinics should be well co-ordinated and adequately resourced, and take place on a routine basis (Gruen et al. 2004) with a specialist (or group of specialists) visiting a community anywhere from once every few weeks to once a year (Gruen

et al. 2002). The specialist may see patients in a primary care office where patients usually go to see their primary care practitioner; alternatively, the clinics may be offered in small hospital emergency departments or outpatient clinics.

Many specialty areas can be covered during outreach, such as surgery, obstetrics/gynaecology, ophthalmology and oncology (Gruen et al. 2006). When clinics are conducted in primary care offices, visit schedules should be negotiated with local primary care staff. Portable equipment may be used, such as slit-lamps for conducting eye examinations or colposcopes for gynaecologic exams (Gruen et al. 2006). When clinics are conducted in hospital settings, the equipment may be hospital-owned, and case schedules are negotiated with hospital administration. Outreach clinics may last a few hours to a week, depending on the service that is provided (Gruen et al. 2008). For example, visiting surgical specialists will frequently spend half a day in a clinic and half a day in the operating room.

The most common model, described here, is a “shifted outpatients” model in which, within limits, specialists provide the same kinds of consultations, investigations and procedures as they do in their regular settings (Gruen et al. 2004). Alternatively, specialists and primary care practitioners may use outreach visits as a vehicle to permit additional activities, such as staff education and joint consultations with patients.

What the Research Says

Research evidence from a Cochrane review shows that specialist outreach can significantly improve access to specialist care for patients (Gruen et al. 2004). While the highest-quality studies included in this review were conducted in major urban settings, such as inner cities, research in a disadvantaged rural setting showed greater improvements in access to specialist care (Gruen et al. 2006). In particular, the investigators found that improvements in access to specialist consultations and procedures in this setting came without increased primary care referrals as well as without additional demand for hospital-based care (Gruen et al. 2006).

Specialist outreach can also lead to improvements in health outcomes for patients and greater efficiency in the use of hospital-based services by reducing unnecessary referrals and investigations (Gruen et al. 2004). This is particularly the case when outreach specialists work collaboratively with or provide education seminars to local primary care practitioners (Gruen et al. 2002, 2004; Katon et al. 1997, 1999; Roy-Byrne et al. 2001; Vierhout et al. 1995). Increased collaboration and consultations may improve provider-to-provider communication and lead to more positive patient experiences (Gruen et al. 2004). Hosting specialist consultations in primary care settings may also offer such benefits as familiarity and reduced stigma for patients and fewer distractions for providers (Gruen et al. 2004).

In terms of costs, international research on collaborative management of depression in urban settings has found that specialist outreach costs more for healthcare systems when compared with typical, hospital-based specialist care (Simon et al. 2001; Von Korff et al. 1998). However, in rural settings, other international research suggests one specialist visit can save many patients the cost and time of travel (Gruen et al. 2001). In some Canadian jurisdictions, medical travel costs are funded by the health-care system. However, in other areas, patients must pay for these costs out of pocket.

Conclusion

There are a number of proposed solutions for increasing access to specialist services in rural and remote areas – from telemedicine (interactive video consultations) (Duplantie 2007) to expanding the role of family physicians in providing specialist care (SRPC 2006; Glazebrook and Harrison 2006; Working Group of the SRPC 2001). Outreach services are a well-evaluated way of enabling patients from rural and remote populations to access specialty care without incurring travel costs and the other inconveniences associated with travel. Importantly, these clinics allow patients to have their families and other loved ones accompany them to their appointments, if need be.

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Does Equity in Healthcare Use Vary across Canadian Provinces?

L'équité dans l'utilisation des services de santé varie-t-elle entre les provinces canadiennes?



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Abstract

For over 30 years, Canadian provinces have provided universal public insurance for hospital and physician care; however, evidence points to persisting socio-economic inequity in healthcare use. Because provinces hold the responsibility for planning and funding most publicly insured health services, there is some variation in health system characteristics. In the context of such variation, this study systematically investigated equity in healthcare use across the provinces. Drawing on the 2003 Canadian Community Health Survey, the author applied the indirect standardization approach to create an index of needs-adjusted inequity in the probability, total and conditional number of GP, specialist, hospital and dentist visits. Results reveal some variation in inequity across provinces; however, national trends show pro-rich inequity in the probability of a GP, specialist and dentist visit, and no significant evidence of inequity in inpatient care. Aside from income, the main socio-economic factors associated with inequity are education, complementary insurance for prescription drugs and dental care and, in some cases, region of residence. When total (and conditional) number of visits are examined, the pro-rich inequity in GP care disappears in all provinces.

Differences in the extent of and contributors to inequity that are observed across the provinces suggest a need for more in-depth provincial policy analyses.

Résumé

Depuis plus de 30 ans, les gouvernements des provinces canadiennes offrent des régimes d'assurance publique pour les services médicaux et hospitaliers. Toutefois, les données montrent qu'il existe encore des iniquités socioéconomiques dans l'utilisation des services de santé. Puisque les provinces sont responsables de la planification et du financement de la plupart des services de santé, il y a des variations entre les différents systèmes de santé. Dans ce contexte de variation, l'auteure de la présente étude a examiné systématiquement le principe d'équité dans l'utilisation des services de santé entre les provinces. En s'appuyant sur les résultats de l'Enquête sur la santé dans les collectivités canadiennes de 2003, l'auteure a employé la méthode de standardisation indirecte afin de créer un indice d'iniquité ajusté selon les besoins pour calculer le nombre probable, total et conditionnel de visites chez les omnipraticiens, chez les spécialistes, à l'hôpital et chez le dentiste. Les résultats indiquent une certaine variation dans l'iniquité entre les provinces, toutefois, la tendance nationale montre une iniquité favorisant les mieux nantis pour ce qui est de la probabilité d'une visite chez l'omnipraticien, le spécialiste ou le dentiste et n'indique aucun résultat significatif d'iniquité dans les soins aux personnes hospitalisées. Mis à part le revenu, les principaux facteurs influant l'iniquité sont la scolarisation, les assurances complémentaires pour médicaments et soins dentaires et, dans certains cas, le lieu de résidence. Pour ce qui est des soins omnipraticiens, l'iniquité en faveur des mieux nantis disparaît dans toutes les provinces si l'on tient compte du nombre total (et conditionnel) de visites. Les différences observées entre les provinces dans la dispersion et dans les facteurs contribuant à l'iniquité laissent croire qu'il est nécessaire d'effectuer une analyse plus détaillée des politiques provinciales.

THE STATED OBJECTIVE OF CANADIAN HEALTH POLICY IS TO PROTECT, promote and restore the physical and mental well-being of its residents and to facilitate access to health services. Equity in healthcare is a concept of vital importance to Canadians (Romanow 2002), and "reasonable" access to healthcare is legislated in the *Canada Health Act* of 1984: "insured persons must have reasonable and uniform access to insured health services, free of financial or other barriers. No one may be discriminated against on the basis of such factors as income, age, and health status."

While equal access to care is a major objective of the Canadian health system as reflected in a number of pieces of national legislation, it is also echoed at the provin-

cial level (e.g., Health Services Restructuring Commission 1999; Ministry of Health and Ministry Responsible for Seniors 1997). The actual enactment of policy occurs at the provincial level: provinces are responsible for planning and funding most public healthcare services (hospital and physician care) dating back to the 1867 constitution granting them exclusive powers of “establishment, maintenance and management of hospitals.” Differences in the level and sources of healthcare financing, payment mechanisms, benefits packages, supply of health services and level of further decentralization to regional and local levels may, thus, lead to different degrees of inequity in access to health services.

Separate universal systems of hospital and physician care, governed by provincial legislation, are influenced by the federal government through its fiscal transfer policy: provinces must conform to the five principles of the *Canada Health Act* (universality, public administration, comprehensiveness, portability and accessibility) in order to receive federal cash transfers (Marchildon 2005). Meanwhile, coverage of services outside physician and hospital care is left entirely to the discretion of the provinces, although there is some consistency in the extent to which provinces subsidize these costs. For example, prescription drug costs are generally covered by the different provincial insurance plans for some population subgroups such as those receiving social assistance, older people and individuals with specific diseases, with varying levels of cost sharing (Grootendorst 2002). The majority of individuals not covered in a provincial plan are privately insured through employer-sponsored insurance, although those without adequate coverage may face additional cost barriers to accessing care.

Studies of equity reveal that the introduction of universal coverage better aligned the distribution of health services according to need (Mhatre and Deber 1992), although inequity persists. Research in this area approximates access to healthcare with utilization, although the two concepts may encompass different sets of conditions (Donabedian 1972; Oliver and Mossialos 2004). Equal access for equal need presumes that individuals are given equal opportunities to access services; however, inequity in utilization may not solely reflect inappropriate or unfair differences in service use, as utilization is affected by personal characteristics such as individual preferences, expectations and beliefs. Therefore, observed inequity in utilization may not necessarily be unfair. However, examining equity in terms of healthcare utilization is consistent with interpretations by federal and provincial governments (Birch and Abelson 1993; Birch et al. 1993).

A vast literature reveals inequity in healthcare use after controlling for need in some sectors and provinces in Canada. Studies tend to show that higher income and education are associated with a greater likelihood of specialist physician service use, but not always with use of primary physicians, and people with lower income may be making more use of hospital services but not necessarily surgical services (e.g., Dunlop et al. 2000; Manga et al. 1987; Roos and Mustard 1997; Veugelers and Yip 2003; McIsaac et al. 1997; Roos et al. 2004). However, others find income is neither relevant

in physician (Finkelstein 2001) nor hospital care (Asada and Kephart 2007). A few studies have investigated equity in specific procedures, demonstrating higher rates of diagnostics and cardiac surgeries for higher-income individuals (Alter et al. 1999; Demeter et al. 2005). The most recent and technically advanced study investigating equity in 21 developed countries including Canada found that standardizing for need differences, higher-income groups had increased probability of both general practitioner (GP) and specialist visits (pro-rich distribution of healthcare use), with the reverse seen in inpatient care (pro-poor distribution). Further, intensity of use is pro-rich for specialist visits but pro-poor for GP care (van Doorslaer and Masseria 2004). The importance of this methodological approach is that it not only measures the existence of inequity, but also quantifies its extent, thus enabling comparison across service areas, jurisdictions and time periods. What remains missing in the literature, however, is a systematic examination of equity in the different healthcare sectors across the Canadian provinces, given that each province aims to achieve equity, yet differs to some extent in system characteristics.

Methods

Data

This study investigates the level of inequity in healthcare use across the provinces, drawing from the Canadian Community Health Survey (CCHS). The CCHS is a cross-sectional survey of persons aged 12 years or older living in private dwellings. It is based on a multistage cluster design in which the dwelling is the final sampling unit. Persons living on Indian reserves or Crown lands, residents of institutions, full-time members of the Canadian Forces and residents of certain remote regions are excluded from this survey. The CCHS is representative of approximately 98% of the Canadian population aged 12 or older. This study is based on the Public Use Microdata from 2003 (cycle 2.1). Individuals under age 15 (5.5% of total sample) are not included in the analysis in order to focus on the adult population. Also excluded are individuals missing relevant income, health or socio-demographic data (17% of the total sample). Almost all the missing data can be explained by missing income information: there are only negligible differences between those missing income and the rest of the sample in terms of health status or healthcare use, although they are disproportionately represented by the youngest age group (15–19). Territories are also not included owing to under-sampling of these regions. Sampling weights included in the public data set are used for all analyses.

Healthcare use is measured by the following questions:

- [Not counting when you were an overnight patient], in the past 12 months, how many times have you seen, or talked with on the telephone, about your physical, emotional or mental health ...

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- a family doctor or general practitioner? [GP]
- an eye specialist or any other medical doctor (such as a surgeon, allergist, orthopaedist, gynaecologist or psychiatrist)? [specialist]
- a dentist or orthodontist? [dentist]
- In the past 12 months, have you been a patient overnight in a hospital, nursing home or convalescent home? [inpatient]

For the probability models, they were transformed into a dichotomous variable: “no visits” or “1 or more visits”; for the conditional models, only individuals who report any use are included.

Indicators of healthcare need include interactions of age and sex (with dummy variables for the following age groups: 15–34; 35–44; 45–64; 65–74; 75 and above, separately for men and women; men aged 15–34 is the reference category), self-assessed health in five categories (excellent – reference category, very good, good, fair and poor) and moderate and severe activity limitations (no limitations as the reference category). Further indicators of need were not included to avoid the methodological issues arising from the high level of collinearity among the health variables. For dental care, age and self-assessed oral health in five categories (as above) approximate need.

Total household income is measured in five categories and adjusted for the number of people living in the household (but not household composition) to represent individual income. Factors other than need and income have been shown to affect utilization patterns (Aday and Andersen 1981); thus, in order to better understand the contributors to any observed inequity by income, other socio-economic variables were included in the models: education (less than secondary education – reference category, secondary and post-secondary), residing in the capital city of the province and whether they are employed, a student, retired, unemployed or self-employed (reference category). Complementary insurance coverage is also included as a confounding variable in the five models: insurance for prescription drugs in the physician models, for hospital costs (i.e., hotel amenities) in the model of hospital care and for dental care in the dentist model.

Statistical analysis

This study calculates income-related inequity in four areas of healthcare use across the Canadian provinces: GP, specialist, hospital (inpatient) and dental care. It does so by examining the probability of any use, the total number of visits (or nights, in the case of hospital care) and the conditional number of visits (nights). Results of the analysis of conditional models are not reported.

Equity is calculated by comparing the distribution of healthcare use by income with the distribution of healthcare need (health status) using the concept of the concentra-

tion curve (Wagstaff and van Doorslaer 2000). The horizontal inequity (HI) index derives from the difference between the income-related inequality in actual healthcare use and the income-related inequality in need-expected use. The latter is calculated using the predicted use probabilities from a regression on need indicators where the non-need variables are held constant at their mean. The estimates of healthcare need are obtained using a probit model for the probability of a visit (or hospital admission) and an OLS regression for the total and conditional number of visits (nights) because analyses have shown little difference between linear and non-linear models (van Doorslaer and Masseria 2004). The distinction between inequality and inequity is an important one: unequal utilization patterns by income are not necessarily unfair because of the underlying unequal distribution of need, whereas inequity captures any unequal healthcare use by income that remains after need standardization.

By construction, a zero index of horizontal inequity implies that after controlling for differences in need across income groups, all individuals have equal probability of using health services or are using the same amount, regardless of income. After adjusting for need, when service use is more concentrated among the better off (worse off), the horizontal inequity index is positive (negative). The index ranges from -1 to 1 : a positive index implies that individuals with higher income are more likely to visit a physician than one would expect on the basis of their reported need, and vice versa.

In calculating horizontal inequity indices separately for each province, the underlying assumption is that differences in the mean utilization levels across provinces or in the utilization differences among people in different levels of need are acceptable. Thus, I assume that provincial norms of utilization should be used for calculating inequity as opposed to national norms, in light of (often immeasurable) socio-cultural heterogeneity across provinces.

For the analyses of inequity in total number of visits (nights), the decomposition method is used to measure whether socio-economic factors related to income, such as education, residence, employment status and complementary insurance coverage, are contributing to the overall level of income-related inequity (Wagstaff et al. 2003). Different utilization patterns across income groups can theoretically be due to underlying related socio-economic characteristics such as education and insurance status; therefore, the decomposition analysis allows us to discover what other factors may be driving inequity. The contribution of each variable to inequity is a product of its impact on demand, as measured by its marginal effect on utilization multiplied by the mean value of the regressor and divided by the mean predicted probability, and its correlation with the income distribution. For example, a positive contribution of education to specialist inequity indicates that higher education is associated with both higher income and utilization.

Results

There is some variation in reported healthcare utilization across the country and in the levels of complementary insurance coverage (Tables 1 and 2). Differences across the provinces in the extent of horizontal inequity are also observed, but some national patterns can be seen (Figures 1–3).

TABLE 1. Descriptive statistics for healthcare utilization: weighted percentage with one visit (mean number of visits) and percentage without a regular doctor

	n	GP	Specialist	Inpatient	Dentist	No regular doctor (%)
Newfoundland	3,067	83.04 (4.15)	51.13 (1.15)	9.84 (0.76)	46.38 (0.91)	13.36
Prince Edward Island	1,530	84.14 (3.10)	53.82 (1.39)	10.94 (0.80)	63.31 (1.26)	8.05
Nova Scotia	3,821	84.53 (3.92)	52.78 (1.32)	9.28 (0.61)	60.92 (1.29)	5.52
New Brunswick	3,827	80.24 (3.36)	51.77 (1.16)	11.33 (0.84)	52.30 (1.07)	7.55
Quebec	21,552	69.69 (2.25)	56.67 (1.30)	8.88 (0.54)	56.22 (1.05)	26.10
Ontario	34,419	79.76 (3.26)	55.40 (1.34)	7.52 (0.44)	69.61 (1.48)	8.41
Manitoba	5,827	77.00 (3.00)	51.16 (1.22)	8.77 (0.53)	60.24 (1.22)	16.47
Saskatchewan	5,716	80.63 (3.66)	54.59 (1.19)	9.62 (0.57)	54.73 (1.02)	14.45
Alberta	10,377	80.33 (3.35)	52.17 (1.16)	8.22 (0.42)	62.57 (1.21)	16.41
British Columbia	12,367	82.24 (3.74)	49.26 (1.20)	7.78 (0.41)	67.43 (1.41)	10.92
CANADA	104,510	77.85 (3.12)	54.18 (1.28)	8.26 (0.49)	63.69 (1.29)	14.26

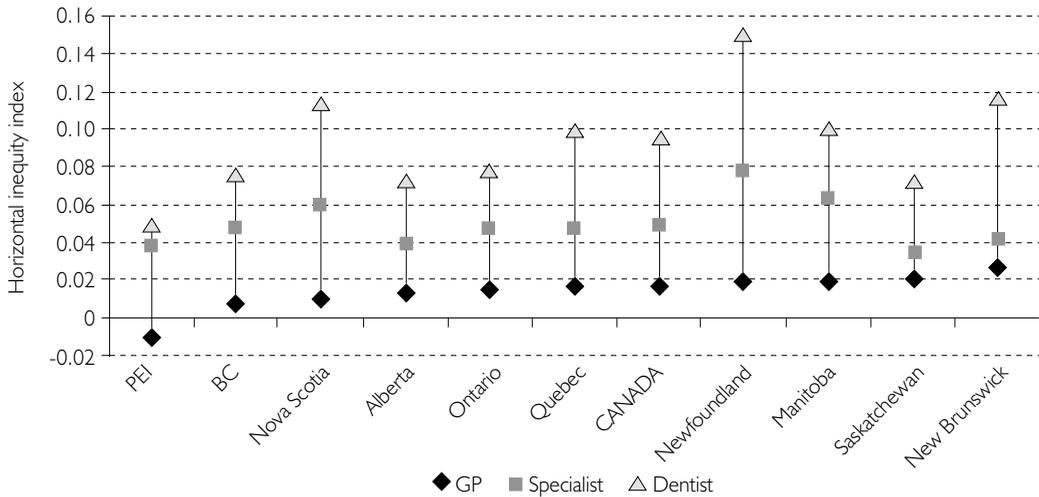
TABLE 2. Weighted percentage reporting complementary insurance coverage for prescription drugs, dental care and hospital amenities

	Prescription drugs	Dental care	Hospital amenities
Newfoundland	69.15	49.66	56.79
Prince Edward Island	67.02	54.19	58.27
Nova Scotia	77.53	59.93	65.37
New Brunswick	73.27	60.11	61.38
Quebec	89.80	46.45	61.27
Ontario	77.97	68.84	65.45
Manitoba	72.96	65.68	66.42
Saskatchewan	73.32	65.71	66.25
Alberta	80.26	71.14	70.07

TABLE 2. Continued

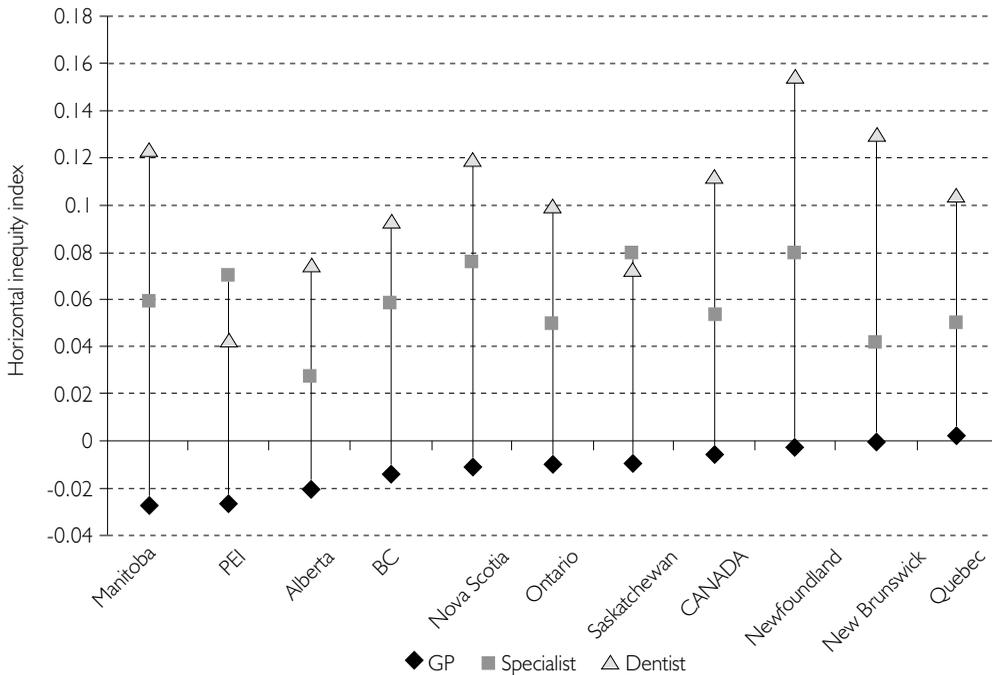
British Columbia	72.92	62.97	53.61
CANADA	79.77	61.92	63.23

FIGURE 1. Equity in the probability of a GP, specialist and dentist visit (ranked by GP)



Note: All indices significantly different than zero at 95% level except for GP probability in PEI.

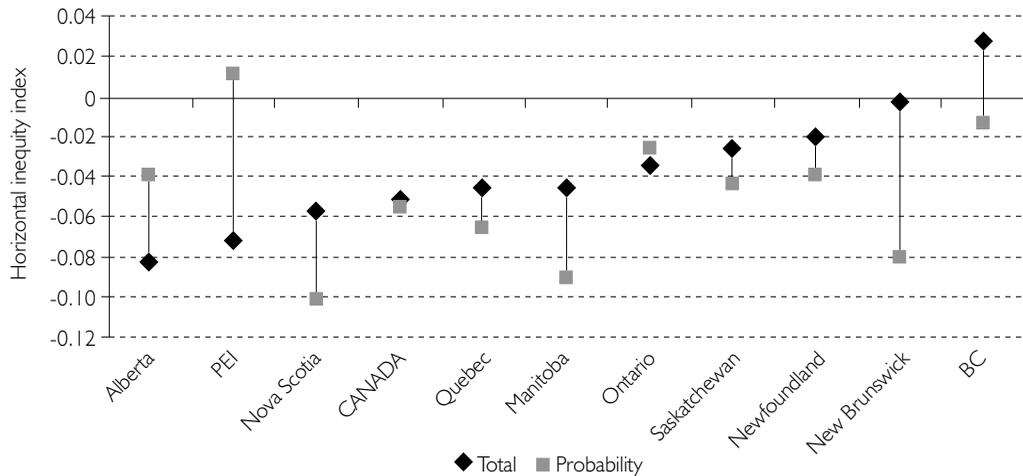
FIGURE 2. Equity in the total number of GP, specialist and dentist visits (ranked by GP)



Note: All specialist and dentist indices significantly different than zero at 95% level except specialists in Alberta. All GP indices non-significant except in Manitoba.

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FIGURE 3. Equity in the probability of hospital admission and total number of nights spent in hospital (ranked by total nights)



Note: All indices non-significant except total nights in Alberta and Canada, and probability of inpatient admission in Nova Scotia, Canada, Quebec, Manitoba and New Brunswick.

There appears to be consistent pro-rich inequity in GP visit probability, and pro-poor inequity in the total and conditional number of visits. The exceptions are Quebec, which has no significant inequity in total GP visits, and Prince Edward Island (PEI), which has a pro-poor, although non-significant, inequity in GP visit probability.

For specialist visits, pro-rich inequity is consistently higher than is seen with GPs for both the probability of a visit and also the total number of visits in all provinces. However, when only those who had one specialist visit are included, i.e., conditional number of visits, the observed inequity disappears in most cases (ranging between -0.01 and 0.05), with the exception of Alberta and PEI, where it remains significantly pro-rich (results are not reported).

Dental care is the most significantly pro-rich, both for the total number and the probability of at least one visit. However, notable variation is observable across the provinces, with the lowest level of inequity in PEI and Saskatchewan and the highest in New Brunswick and Newfoundland. As seen with specialist visits, upon examining the conditional number of visits the pro-rich inequity becomes non-significant in most provinces, with the exception of British Columbia and Ontario, where it remains significantly pro-rich (with a range from -0.011 to 0.020 across the provinces).

In the case of inpatient care, significant variation of inequity appears across the provinces, although the total number of nights spent in hospital is pro-poor but non-significant in all provinces but Alberta. The probability of spending a night in hospital is significantly pro-poor in five provinces (the highest in Newfoundland) and non-significantly pro-poor in those remaining, with the exception of PEI, where it is pro-rich (but non-significant). Comparison of inequity in admissions, however, is difficult

because of the small sample sizes in some provinces, coupled with low admission rates.

The results of the decomposition analyses provide some indication of the drivers behind the differences in healthcare inequity across the country. The contributors to inequity in total number of visits (hospital nights) are shown in Figures 4–7. Apparently, income itself is not the only cause of inequitable patterns of healthcare use by income groups; other socio-economic factors are also contributing to inequity.

FIGURE 4. Contributors to inequity in total number of GP visits (ranked by HI index)

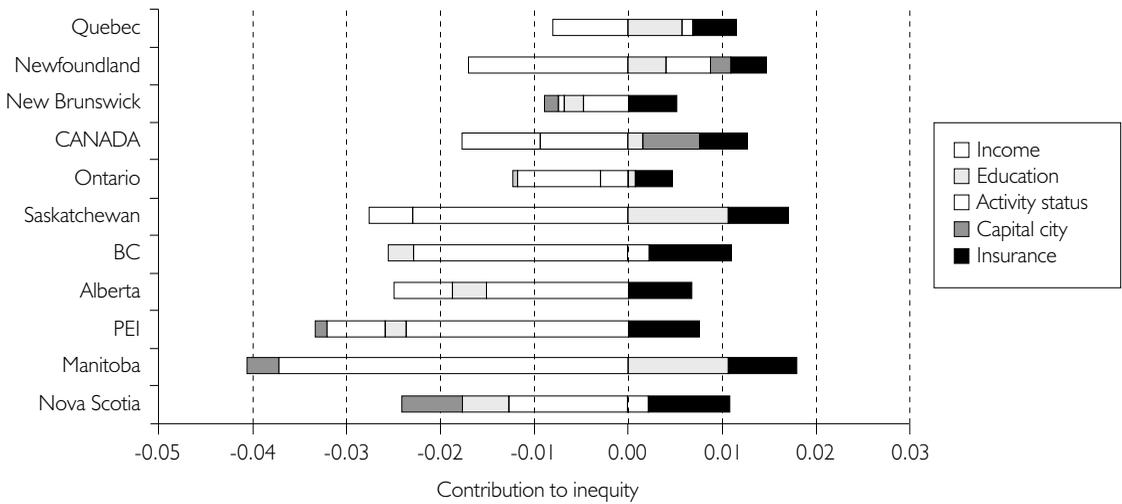
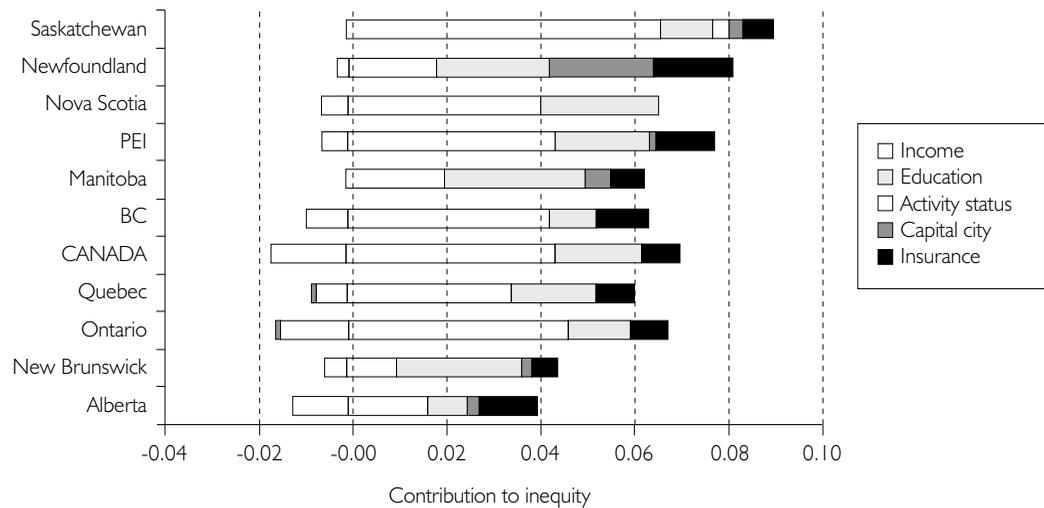


FIGURE 5. Contributors to inequity in total number of specialist visits (ranked by HI index)



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FIGURE 6. Contributors to inequity in total number of hospital nights (ranked by HI index)

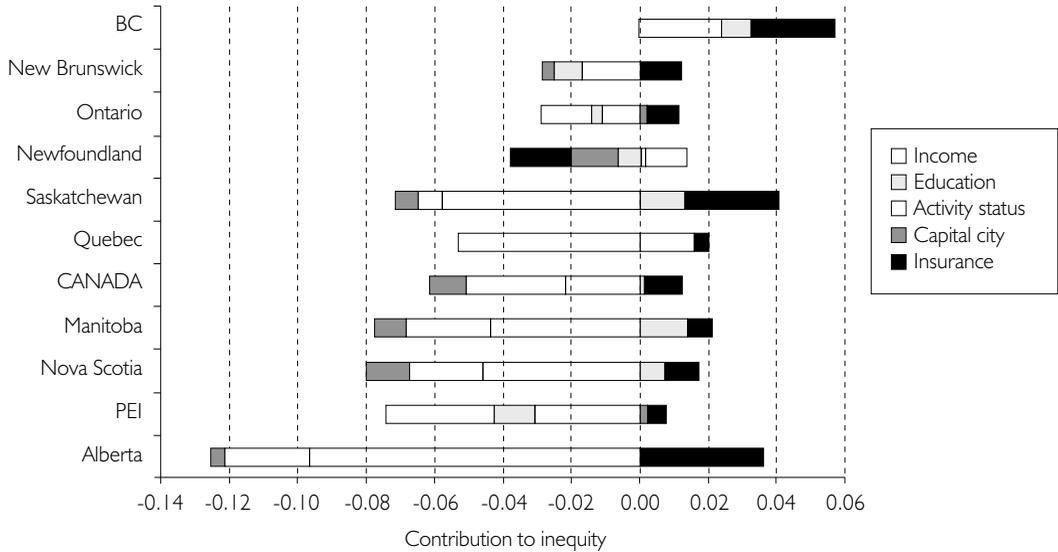
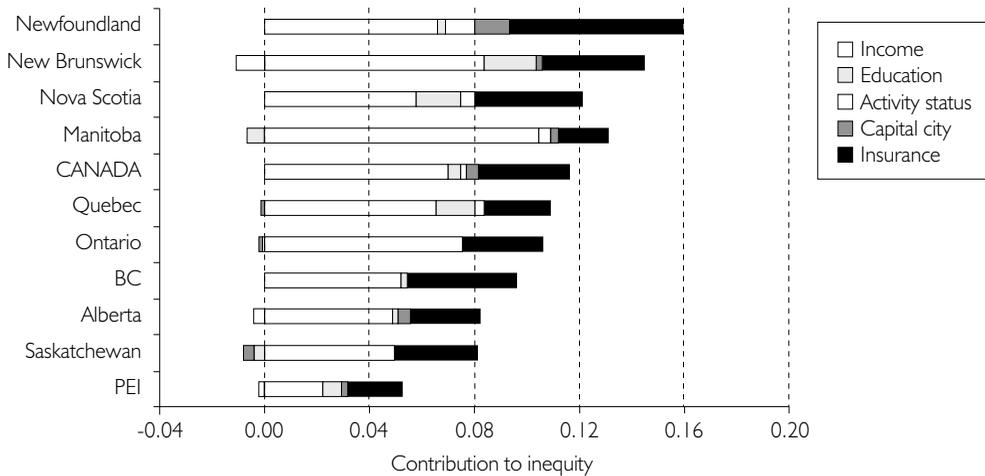


FIGURE 7. Contributors to inequity in total number of dentist visits (ranked by HI index)



For GP care, total use is pro-poor in all provinces except Quebec; however, the contributions of prescription drug insurance coverage, education and activity status are not much higher here than in the other provinces, while the negative role of income is less important. In other words, individuals with lower income are still making more use of services than those with higher incomes, but to a lesser extent in Quebec than in the other provinces.

For specialist care, the highest pro-rich inequity can be found in Saskatchewan, Newfoundland and Nova Scotia. In Saskatchewan, income is the most important

driver of inequity. In Newfoundland, the contribution of urban (capital city) residence is pro-rich, unlike all other provinces but Manitoba and Saskatchewan, contributing about as much as income, education and prescription drug coverage. In Nova Scotia, pro-rich inequity appears to be caused by income, education and drug coverage.

Hospital care is pro-poor in all provinces but British Columbia; there, the (non-significant) pro-rich inequity is related to income, education and insurance coverage for hospital amenities. In Alberta, where nights spent in hospital is most pro-poor, this finding is largely explained by the negative impact of income.

The main contributors to inequity in dental care are income and dental insurance coverage in all provinces. Income contributes more to the pro-rich inequity than insurance in all provinces except Newfoundland, where income and insurance contribute about equally; it is here that inequity is most pro-rich.

Discussion and Conclusions

In Canada, the provinces share national constraints on social policies, and historical and macroeconomic context. Furthermore, training of health professionals is harmonized across the country, and federal equalization payments redistribute federal and provincial taxes from the wealthier to the poorer provinces with the aim that they all have largely comparable resources for public services. However, variation still exists in spending per capita, in the public/private mix of funding and in supply and quality of care (CIHI 2006), all of which may affect equity in healthcare use. In this analysis, similar patterns of inequity appear across the provinces, although with some variations in extent and in the underlying contributors.

Overall, the results demonstrate pro-rich inequity in the probability of using physician and dental services. For the total number of physician visits, results for specialist and dental care are almost unchanged, but for GP visits inequity nears zero or becomes pro-poor (only significantly in Manitoba). Therefore, there may be barriers to accessing a GP for an initial visit for lower-income groups that can be considered more patient-driven, but the intensity of primary care use, which is more provider-driven, is more equally distributed. Moreover, conditional upon one visit, in all provinces inequity in GP visits becomes significantly pro-poor, and even nears zero for specialist care. Therefore, the well-documented disparity in specialist care favouring higher-income and better-educated individuals (see, for example, Dunlop et al. 2000; van Doorslaer and Masseria 2004) may be important in securing the initial appointment, which is available only through GP referral, but not in accessing further needed specialist care. This finding has also been demonstrated at the national level using earlier data from the CCHS (Asada and Kephart 2007).

It is not surprising that pro-rich inequity is highest in dental care (very high in most provinces, i.e., the horizontal inequity index is 0.10 or larger), given that this sec-

tor is left entirely outside the public system and federal oversight, and complementary insurance coverage is held almost exclusively by the wealthy and younger age groups (Bhatti et al. 2007). In addition to having the highest inequity, dental care also shows notable variability in extent of inequity across the provinces: the greatest pro-rich inequity is found in Newfoundland, where both mean utilization and insurance coverage are lowest, and the least inequity in PEI and Alberta, where utilization rates are high and, in Alberta, insurance coverage is the highest. This finding suggests that more public funding could be directed towards subsidizing dental care costs or dental insurance costs to improve access for lower-income groups.

Wide variations in the extent of inequity in hospital care are seen across the country, although there is little evidence of significant inequity. Overall, there is a mostly non-significant trend suggesting that poorer groups are more likely to be admitted to hospital, and are also staying longer than higher-income groups. The equitable or pro-poor distribution of hospital care differs from the other service areas, and may relate to a number of factors – such as greater integration of hospital-level services within the regional health administrations, which may better meet the needs of disadvantaged groups, or lack of effective primary care, which may lead to greater reliance on emergency hospitalizations for lower-income groups (as observed in Ontario; see Glazier et al. 2006).

No single province has the lowest level of income-related inequity in all four service areas, although PEI, a very small island province of fewer than 140,000 inhabitants, appears to have among the lowest pro-rich inequity in primary and dental care. This finding may relate to fewer geographic barriers to access. Geographic barriers may also partly explain the high level of pro-rich inequity in specialist and dental care in Newfoundland, where region of residence (measured by living in the capital city) contributes to pro-rich inequity; in other words, individuals living in the capital city are more likely to have higher income and are also more likely to make use of services.

The differential impact of complementary insurance across the country also plays some role in explaining the observed variations. For GP and specialist care, complementary coverage for prescription drugs appears to contribute more to pro-rich inequity in the Atlantic provinces, where levels of coverage are among the lowest (Table 2). This finding would suggest that improving coverage for services falling outside physician and hospital services (Romanow 2002) may reduce the observed inequity in these provinces. The role of prescription drug coverage in explaining the pro-rich inequity in GP care may be due to the “bundling” of these services (Tuohy et al. 2004); thus, the cost of prescription drugs may deter some individuals from making the initial GP appointment. Indeed, the decomposition of GP inequity reveals that prescription drug coverage is the main, if not the only, positive contribution to inequity (as shown in Figure 4).

Patterns of inequity may also relate to differences in utilization rates. Descriptive statistics show that PEI has a high-use population compared to the other provinces/ter-

ritories, in particular for GP visit probability. Moreover, the provinces with the lowest levels of inequity in GP services are also those with the highest utilization rates – PEI, Nova Scotia and British Columbia. The same relationship also exists to some extent with dental care, as noted above. Quebec appears as somewhat of an outlier, with lower rates of GP utilization alongside the lowest proportion reporting a regular doctor, yet relatively low or no inequity in GP probability and total number of visits, respectively. This finding could relate to Quebecers' relatively easier access to specialists, as reflected in the high rate of use and comparatively low level of pro-rich inequity.

These findings should be interpreted in light of the methodological limitations of this study. Self-reported healthcare use may be biased because of problems in recall. If recall difficulties affect all population groups equally, then they are not a problem; however, if population groups report use in a systematically different way (e.g., older people may have worse recall), then bias is introduced. Some researchers believe self-reporting of physician visits may be unreliable (Roberts et al. 1996). Recall for hospital visits is generally better than that for physician contacts (Barer et al. 1982).

Considerable debate surrounds the approximation of need with self-reported health status (Goddard and Smith 2001). First, although measuring need for healthcare with ill health is the most convenient and commonly used approach, it assumes that all health problems being measured are effectively treated by healthcare, which is not always the case. Second, biases in the reporting of health may systematically exist across population groups (Adamson et al. 2003; O'Donnell and Propper 1991; Lindeboom and van Doorslaer 2004). However, numerous studies support the validity of self-reported health status, demonstrating significant relationships with other measures of health status (Kaplan and Camacho 1983; Mossey and Shapiro 1982; Sutton et al. 1999). It is also important to note that missing data (mostly income of younger age groups) reduces the generalizability of the findings to the under-20 population. Finally, this line of research, which is based on a macro study of inequity in healthcare in Canada rather than a micro-level investigation of a specific disease or service category, does not address the issue of appropriateness or quality of care.

To conclude, this study reveals some variation across the provinces in rates of healthcare use and also in levels of income-related inequity alongside apparent national trends. These trends include evidence of inequity favouring higher-income groups (for GP, specialist and dentist visit probability, total specialist and dentist visits and, to a lesser extent, number of specialist and dental visits conditional on one visit) and limited evidence of pro-poor inequity (in hospital care and number of GP visits). In the absence of direct financial barriers to access, these findings could relate to geographical barriers, inability to secure a regular physician, lack of insurance for the costs associated with physician services, such as prescription drugs, and difficulty in obtaining a referral to specialist care. Financial barriers may, however, exist in the case of specialist care, since not all services are fully funded by provincial public insurance systems, e.g.,

some dermatology and ophthalmology services. Moreover, inequity is clearly the highest in dental care, where there is very little public funding; therefore, substantial costs likely deter lower-income groups from seeking care. These national trends suggest that the federal oversight and public funding of hospital and physician sectors help to achieve the goal of “reasonable and uniform” access to care, in particular in hospital and GP services, as indicated by low levels of inequity in healthcare use. Further research into provincial policies that affect utilization, such as the coverage of services outside the public insurance programs, will increase understanding of the observed variations in levels and drivers of inequity.

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Parallel Lines Do Intersect: Interactions between the Workers' Compensation and Provincial Publicly Financed Healthcare Systems in Canada

Quand les lignes parallèles se croisent :
interaction entre les commissions des accidents
du travail et les systèmes de santé provinciaux
au Canada



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Parallel Lines Do Intersect

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Abstract

The authors of this paper use a case study approach to document and analyze the interactions that arise between two healthcare payers in Canada: the provincial public healthcare insurance plans and the provincial workers' compensation boards. Through a documentary review and semi-structured key-respondent interviews, the study identified a set of policy events and decisions undertaken by each payer that had consequences for the other. These events, which included changes to governance, funding and service delivery within each system, generated interactions transmitted through the political, institutional and economic environments (primarily through competition for the same resources) and cross-system learning. The two payers currently lack a formalized process by which to consider such spillover effects and to coordinate policy between them. These interactions, and their associated consequences for both payers, raise important policy challenges and, more generally, provide insight into the dynamics of parallel systems of healthcare financing.

Résumé

Les auteurs du présent article ont recours à l'étude de cas pour documenter et analyser l'interaction entre deux payeurs de services de santé au Canada : les régimes provinciaux d'assurance pour les services de santé et les commissions provinciales des accidents du travail. Les entrevues semi-structurées menées auprès de répondants clés et l'analyse documentaire ont permis de dégager un ensemble de décisions et de démarches politiques dont la mise en place, par l'une des entités, a des conséquences sur l'autre. Ces activités, notamment les changements en matière de gouvernance, de financement ou de prestation des services, favorisent une interaction, qui emprunte les

canaux politiques, institutionnels et économiques (principalement par la compétition pour accéder aux mêmes ressources), et l'apprentissage entre les systèmes. Il y a présentement absence de processus permettant d'examiner les effets de telles retombées ou de coordonner les politiques entre les deux entités. Les interactions et leurs conséquences pour les deux payeurs, mettent au jour d'importants enjeux politiques et, de façon plus générale, donnent un aperçu des dynamiques associées au financement d'un système de santé parallèle.

IT IS COMMONLY BELIEVED THAT CANADA HAS ONLY A SINGLE PAYER FOR medically necessary physician and hospital services: provincial public insurance plans. This belief, in fact, is false: Canada has several parallel payers for these services. The federal government, for instance, finances healthcare services for aboriginal peoples, the RCMP, the military and federal prisoners (who, along with visitors to Canada, are excluded from the Canada Health Act's [CHA] definition of insured persons); workers' compensation boards finance healthcare required to treat workplace-related injuries and illness (which are excluded from the CHA's definition of insured services); and automobile insurers finance healthcare needed to treat injuries associated with motor vehicle accidents (also excluded from CHA's definition of insured services). These payers provide their beneficiaries access to healthcare services on terms and conditions different from those offered to individuals by provincial health insurance plans. The existence of distinct, parallel payers alongside the provincial insurance plans raises a number of important policy issues, foremost of which is the nature of the interactions between the parallel payers.

This paper examines the interactions that arise between the provincial public health insurance plans and one of Canada's parallel payers: workers' compensation boards (WCBs). Our goal is both to document and to clarify the nature of interactions between parallel systems, interactions that can be both beneficial and harmful and that can range from the purely political to those that affect the care received by individuals. The WCBs present an interesting case study of parallelism because the 13.1 million workers covered by workers' compensation are simultaneously eligible for healthcare through provincial public plans and, if injured in the workplace or ill as a result of an occupational disease, through the WCBs. The payer depends only on whether the illness or injury is work-related.

Workers' compensation in Canada long predates medicare. It was established in the early part of the 20th century as a system of social insurance, financed by employers (currently through risk-rated premiums to encourage workplace safety) as part of a "historic compromise" in which workers gave up the right to sue employers for workplace-related injuries and illness in return for defined levels of no-fault benefits (Ison 1989).

WCBs finance or provide three types of services and benefits to individuals who suffer a work-related injury or illness: healthcare – the focus of this analysis – which aims to restore an injured worker’s functional capabilities as much as possible and allow a “timely and safe return to work”; vocational rehabilitation, which assists injured workers in finding alternative employment when necessary; and disability benefits, which compensate a worker (temporarily or permanently) for lost income and, in the case of permanent impairment, for pain, suffering and loss of enjoyment of life. WCBs ensure workers’ access to needed healthcare services through a variety of arrangements, including direct provision at WCB facilities and contractual arrangements with both public and private providers. Although WCB healthcare spending is small relative to total healthcare spending in Canada (in 2003, workers’ compensation health spending equaled approximately 1.5% of total provincial healthcare spending, or about 3.8% of provincial healthcare spending on the working-age population (CIHI 2005)), it is concentrated in areas of particular policy concern, such as orthopaedic services and diagnostic imaging.

Methods

For this case study, we gathered data through a documentary review followed by semi-structured interviews with key informants. The documentary review identified events and policy decisions emanating from either the WCB or the provincial healthcare system that would likely have generated spillover effects for the other payer. The review was conducted using the LexisNexis Academic database. All identified newspaper and newswire articles were assessed for relevance in terms of potential for creating important cross-payer effects, and relevant articles were used to construct, for each province, a policy timeline from 1990 to the present that included events and decisions that potentially created interaction between the WCB and the provincial plan.

The semi-structured, key-informant interviews, conducted by telephone between September 2006 and February 2007, were designed to provide an in-depth understanding of the nature of the interactions between the two systems. The interviews were limited to four provinces – British Columbia, Alberta, Manitoba and Ontario – chosen on the basis of the richness of the set of events identified through the documentary review. Twenty-two key-informants were interviewed, with 8, 6, 3 and 5 individuals from British Columbia, Alberta, Manitoba and Ontario, respectively (see Table 1). The key informants were identified through multiple sources, including media reports of selected policy events, research team knowledge of individuals with current or past policy participation in either the workers’ compensation or provincial healthcare sectors in the provinces under study and the key informants themselves. The key informants included past or current members of provincial WCBs (14), provincial ministries of health (1), regional health authorities (4), researchers (2) and a hospital administrator (1). (Some key informants had held multiple professional roles in their careers and could speak to

issues from more than one perspective.) All interviews were audio-recorded, transcribed and checked for accuracy; each key informant had the opportunity to review his or her transcript prior to coding and to review draft study papers.

TABLE 1. Interview subjects

Characteristics	Province				
	ON	BC	MB	AB	Overall
WCB	4	6		4	14
Health ministry		1			1
Regional health authority		1	2	1	4
Researcher			1	1	2
Hospital sector	1				1
Physician					
Total sample	5	8	3	6	22

The interviews varied from 30 to 90 minutes in duration and were divided into two parts. Key informants first reviewed the list of policy events identified for their province through the documentary review, commented on the accuracy and completeness of the listing and identified any missing events. In the second part, key informants selected two events or policy decisions from the list provided or based on their own experience and answered a series of questions regarding the rationale, goals, implementation and consequences (intended and unintended) of each event, as well as its implications for both systems. All transcripts were independently reviewed and coded by the research coordinator (DP) and the principal investigator (JH) and then discussed by the full research team at study meetings.

Results: Interactions between the WCB and the Publicly Financed System

Policy events and decisions identified by respondents

Table 2 lists the policy events and decisions judged by key informants to be associated with important interactions between the WCB health systems and the provincial healthcare systems. Some events were identified by multiple respondents. The events vary along a number of dimensions. Although most were WCB initiatives, they also include actions undertaken by the federal government, provincial governments, regional health authorities and medical associations. They include changes in governance,

Parallel Lines Do Intersect

especially the change to regionalized systems of governance, changes to the methods and levels of healthcare funding and changes in delivery arrangements (Lavis et al. 2004). Many of the events are linked. Funding cutbacks to the provincial plans in the mid-1990s, for instance, and the associated growth in wait times, was one catalyst that impelled WCBs to develop new funding and delivery relationships with providers.

TABLE 2. Respondent-identified policy events and decisions that create interactions between WCBs and the public provincial health insurance plans

	Governance	Funding, payment policies and financial incentives	Delivery arrangements	Other
BC	<ul style="list-style-type: none"> Provincial public plan establishes regionalized system of governance 	<ul style="list-style-type: none"> WCB in 1990s takes a more proactive, independent (from provincial health plan negotiations) approach to negotiations with BCMA Lack of a fee schedule based on a validated relative value scale Federal government decreasing transfers to provinces for healthcare in 1980s WCB offers physicians incentive payment to expedite care for workers 	<ul style="list-style-type: none"> WCB implements novel delivery arrangements, including in-house delivery and visiting clinics, to expedite care for injured workers 	<ul style="list-style-type: none"> WCB establishes a relationship with UBC Centre for Health Services and Policy Research regarding integration of WCB claims data with BC linked database to facilitate research
AB	<ul style="list-style-type: none"> Provincial government passes legislation to allow care provision in non-hospital surgical facilities 	<ul style="list-style-type: none"> Provincial government cuts funding to provincial health plan in 1990s WCB establishes its own fee schedule and begins direct negotiation with Alberta Medical Association WCB uses a combination of financial incentives and standards of care to expedite care for workers 	<ul style="list-style-type: none"> WCB explores alternative service delivery models to expedite care for injured workers Private interests establish private, for-profit MRI clinics Selected Regional Health Authorities create separate, expedited care streams for WCB clients WCB establishes contractual arrangements with healthcare professionals and facilities to define standards of business (e.g., accreditation) practice and standards of care through preferred provider relationships 	

TABLE 2. Continued

MN		<ul style="list-style-type: none"> • WCB begins direct negotiations with Manitoba Medical Association • WCB pays financial incentives to private clinics for expedited care 	<ul style="list-style-type: none"> • WCB establishes contractual arrangement with (public) Pan Am Clinic for expedited care 	
ON	<ul style="list-style-type: none"> • Historical exclusion of WCB from <i>Canada Health Act</i> • Lack of independence of WCB from political process • Provincial government passes the 1991 <i>Regulated Health Professions Act</i> 		<ul style="list-style-type: none"> • WCB establishes new service delivery models to facilitate early access and treatment for workers • WCB, in collaboration with health professionals, introduces "Programs of Care," which provide evidence-based treatment plans for various worker injuries • WCB introduces nurse practitioner-based case management program to ensure timely, appropriate care for workers • WCB devolves care from WCB Downsview Rehabilitation Centre to community-based clinics through contractual relationships 	<ul style="list-style-type: none"> • Workplace Safety and Insurance Board establishes the Institute for Work and Health to provide independent research evidence

Key types of interaction between the WCBs and provincial plans

Interactions between the WCBs and the provincial public plans arose most often because actions by one affected the broader environment in which both payers operate. Interactions generally work through the political environment, the institutional environment, the economic environment (especially in the competition for shared resources) and cross-payer learning. Interactions in each of these dimensions arose in each province, though the specific events that generated them often varied across provinces.

INTERACTIONS IN THE POLITICAL ENVIRONMENT

A recurring theme in the interviews was that the "politics of medicare" imposed constraints on WCBs' ability to act in ways that were legal but perceived by government to have unacceptable political ramifications. One respondent noted, for example:

But [the WCB is] artificially restrained from doing that [providing appropri-

ate healthcare at the right time for the best possible recovery for injured workers] because of the public image or the politics around the public healthcare system. ... they [governments] don't want contrasting systems.

The WCB initiatives of most concern were strategies to expedite care for workers by sending patients out of province (including to the United States), contracting with private for-profit clinics and contracting for "excess" capacity within the publicly funded infrastructure. Such initiatives had political impacts because they implied that Canada has "two-tier" healthcare. Faster care for workers also served as a reminder that the public system was not delivering timely care. This perception not only creates political difficulties for a provincial government but, some argued, could more generally erode support for publicly financed healthcare:

... when they [WCB] started to manoeuvre some of their clients through the system quicker ... a bit of a black cloud was going to hang over the organized system for the rest of the population. ... a number of commentators went to great lengths to flag this as a mark of the deteriorating capacity of the public system and the great advantages [of] this semi-privatization model

The political responses to these concerns range from moral suasion – quietly asking WCBs not to pursue such strategies – to limiting the nature of certain contractual relationships between public facilities and WCBs, to outright prohibition. The Ontario WCB, for instance, was prevented from transferring orthopaedic surgical services to specialty clinics located in community-based teaching hospitals because the services were sufficiently similar to those obtained (after extended wait) by the general public and, as such, would invite direct comparison:

when you start dealing with cartilage operations on knees or things like that, it has a direct, comparable issue with general public healthcare ... [whereas with] the hand program or the prosthetic program and other things, nobody saw a direct parallel very clearly.

INTERACTIONS THROUGH THE INSTITUTIONAL ENVIRONMENT

Changes to institutional arrangements for governance, funding and delivery in one system can have consequences for the other system. Because of its more dominant role, changes to governance, funding or delivery by the provincial public plan more often had consequences for the WCBs. The change to regionalized governance within the provincial healthcare systems, for example, reduced transaction costs for the WCB and led to greater consistency and coherence of policy across hospital sites by dramatically

reducing the number of organizations with which the WCB had to contract:

We [the WCB] had been interacting essentially with each individual entity in the province. And what's begun since 1997 ... is us moving to interacting with just the six health authorities or processes ... trying to rationalize things through the six health authorities instead of going through two hundred hospitals and god knows how many long-term and short-term clinics and centres.

Changes to the regulatory framework and delivery systems can similarly generate spillover effects. The *Regulated Health Professions Act* (RHPA) in Ontario, for example, facilitated WCB contracting by defining recognized health professions and thereby delineating the providers eligible for WCB reimbursement. Bill 11 in Alberta, which for the first time allowed non-hospital overnight-stay facilities, expanded the range of services for which the WCB could contract with private clinics. Primary care reform within provincial plans, and in particular the creation of larger, multi-professional primary care practice funded through blended arrangements, can benefit the WCB by providing greater scope for interested family physicians to develop occupational health specializations.

INTERACTIONS IN THE ECONOMIC ENVIRONMENT: COMPETITION AMONG PAYERS

Competition among payers for the same scarce resources is one of the most-debated aspects of parallel arrangements. WCB initiatives to expedite care for injured workers, such as incentive payments for physicians to treat injured workers more quickly, contracting with private for-profit clinics and contracting with hospitals for after-hours use, are of particular concern in this respect (see Hurley et al. 2008 for a detailed discussion of these strategies). Supporters argue that WCB initiatives to expedite care for workers can increase access to services in the provincial plan by injecting additional funding into the system and removing WCB cases from queues in the provincial plans. Detractors counter that such initiatives often simply divert resources from the provincial plan, resulting in the same number of cases being treated but with preferential access for workers. The ultimate impact depends on several factors, including the most binding resource constraint among the resources required to produce a service. Even if a surgeon has operating time available for treating patients outside the provincial plan, if another input is in short supply it can still have consequences:

... we have private centres using local resources, so using anaesthetists who work here, it's been a diversion of resources from the public and into the private sector. ... we've had an anaesthesiologist shortage which at least has been exacerbated by the existence of those private efforts.

WCB revenue is increasingly attractive to cash-strapped hospitals. In providing services to WCB cases, hospitals allocate treatment and management resources towards WCB cases:

If there's a scarce resource, hospitals, if they had the choice of having the physios or OTs work in a revenue-generating or a non-revenue-generating area, you can imagine which one they'd choose. ... that might be true too about MRI/CAT scans. ... hospitals certainly have the financial incentive to make sure that their scarce resource of radiology technologists do the paid work

Competition between WCBs and the provincial plans for the same resources puts upward pressure on resource prices, reducing the real ability of each system to provide services with a given budget. The potential for WCB bonuses and incentives for physicians to exert upward pressure on fees in the provincial system was recognized by respondents from both WCBs and ministries of health:

With orthopaedic surgeons, we [WCB] pay a significant premium ... and so that may cause the government some grief. We have to work closely with them to ensure that we're not setting them up to be levered by our fee structure into raising their rates generally.

The docs, as is their wont ... began their negotiation season by doing a deal with the WCB in which WCB paid 10% above our going rate, which put a lot of pressure on us.

The impact of WCBs' private contracting initiatives can also extend beyond the specific services purchased by the WCB. WCB contracts can increase the financial viability of private clinics for which the individual private-payer market alone is insufficient or too risky. Larger-volume WCB contracts can cover the fixed costs, creating a platform from which a clinic can enter the individual private-pay market.

CROSS-SYSTEM LEARNING

Cross-system learning, whereby innovation in one system is adopted by the other, can arise at both the managerial and clinical levels. At the managerial level, for instance, some of British Columbia's regional health authorities built on the WCB contracting experience to introduce their own form of contracting with the private clinics in an effort to reduce wait times in the provincial plan. The Ontario WCB hoped that Ontario's provincial plan might adopt a variation on a WCB nurse-based "pathway" management program designed to help an injured worker navigate the complexities

of the healthcare system to obtain appropriate services. The Alberta WCB's quality initiatives embodied in its preferred provider arrangements can potentially generate changes in practice that benefit all patients of these providers. More generally, because many providers treat both WCB-financed injured workers and public patients, clinical initiatives such as evidence-based practice guidelines in one system can have spillover effects on the other. Finally, initiatives such as the integration of WCB claims into the BC Linked Database and the research of work-related institutes such as the Institute for Work and Health can enhance cross-system learning (Brown et al. 2007).

THE MISSING INTERACTION: LACK OF FORMAL POLICY COORDINATION ACROSS THE TWO SYSTEMS

One of the most striking findings was the absence of mechanisms through which to consider spillover effects or to coordinate policy development between WCBs and ministries of health. While regular communication occurs at the operational level where the two systems share infrastructure (e.g., the billing system), and ad hoc communication takes place at a higher political level between WCB CEOs and ministers of health (this factor tended to depend on personal relationships between individuals), we consistently found gaps in planning and coordination at the deputy minister, assistant deputy minister and director levels. The following comment with respect to WCB initiatives to expedite care typifies what we heard throughout the interviews:

I recall no discourse at all in the planning. ... there was no formalized way of communication. ... all [discussions have] been directly with the institutions themselves. Even now we have very little direct contact with the Ministry.

Discussion and Conclusions

Interaction between parallel systems is inevitable when they draw on the same pool of resources. Interactions arise at all levels, from high-level political concerns down to the activities of individual clinicians and patients. Some interactions depend on the relative sizes of the parallel systems, but many do not. From a political perspective, for instance, the mere existence of even a small parallel payer creates political challenges because it invites comparison. Whether such comparisons are fair or appropriate is often immaterial because such details become lost in the public debate. A small system's effects can also be disproportionately large when its activity is concentrated in selected areas, as is the case for WCBs, and when that activity is leveraged by other system stakeholders, as private clinics have done with WCB contract work.

Health system stakeholders, and providers in particular, will inevitably exploit the presence of parallel payers to pursue their objectives. For example, in recent years physi-

cians have increased their income opportunities through new fees, higher fees and new service opportunities with the WCBs. Unfortunately, some of the very conditions necessary for sound management of a publicly financed healthcare system – a keen eye on costs, accountability, adoption of evidence-informed practices – are precisely the conditions that make a parallel payer attractive to providers and provider organizations.

Parallel systems inevitably generate both efficiency and equity effects. Parallel systems, for example, can compromise efficiency by reducing the overall health generated with society's limited health resources and increase transaction costs for patients and providers as people navigate back and forth across and within the systems. Transaction costs associated with adjudication costs, appeal costs and establishing and maintaining a claim may be particularly important in the workers' compensation system. Parallel payers, some argue, can foster greater innovation and, especially in the case of workers' compensation, increase efficiency of the broader economy by improving productivity. The full set of potential efficiency effects is too complex and subtle to explicate here, but their consideration is central to an assessment of parallel finance.

The equity effects of parallel finance are transparent: individuals accessing care through one system are seen more quickly or receive care of different quality than an identical individual accessing care through the other. Who gets preferential access depends on the nature of the parallel system. In the case of WCBs, the distinction rests solely with the place of injury or cause of illness: if it occurs at work or can be linked to work, then access is through WCBs; if not, patients must rely on the provincial plan. The preferential treatment of workers is increasingly questioned by some (Commission of the Future of Health Care in Canada 2002; Office of the Auditor General of Ontario 2006). Within the current legislative framework, of course, WCB strategies to expedite care for injured workers are fully legal and, indeed, WCBs have a legal obligation to employers and workers to obtain the care necessary to return a worker to work as quickly and safely as possible. (They also have financial incentive to do so because they must pay benefits to a worker who is off work owing to an injury.) A policy review, therefore, would have to confront the more fundamental question of whether there continues to be a convincing policy rationale for the exclusion of workers' compensation from medicare's regulatory framework.

Finally, although the WCBs and the provincial plans are distinct, both serve the public interest, and there appear to be unrealized opportunities to improve policy and practice in both systems through better coordination and communication. Fragmented policy making by multiple payers each considering only its own interests leads to "ricochet effects" – unanticipated effects on other payers active in the same arena – that can ultimately harm the interests of both payers (Gildiner 2001). Better policy coordination between the WCBs and the provincial plans, however, requires creation of institutional structures through which to carry out this all-important work.

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Evaluation of Booking Systems for Elective Surgery Using Simulation Experiments

Simulations expérimentales pour évaluer les systèmes de rendez-vous pour les chirurgies non urgentes



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Abstract

Objective: This study compared two methods of booking elective surgery – booking from wait lists and pre-booking surgery dates at the time of decision to operate – in terms of cancellations of elective procedures and time to surgery.

Methods: The authors conducted simulation experiments with group randomized design, in which the unit of allocation was the hospital and the units of analysis were both the hospital and the patient.

Results: In the case of pre-booking, cancellation of high-priority elective procedures was only one-third as likely as it was in the case of booking from wait lists (odds ratio 0.35; 95% confidence interval 0.18–0.68). After adjustment for hospital and patient factors, the weekly likelihood that patients on the wait list had their operation was about 20% higher for medium-priority procedures (OR 1.21; CI 1.18–1.24) after pre-booking surgery dates.

Conclusion: The findings suggest that redesigning booking processes may improve the performance of surgical services.

Résumé

Objectif : Dans cette étude, on a comparé deux méthodes de planification des rendez-vous pour les opérations chirurgicales non urgentes – les listes d’attentes et les rendez-vous déterminés au moment de la décision de procéder à l’intervention chirurgicale – en fonction des annulations d’intervention et du temps d’attente pour la chirurgie.

Méthodes : Les auteurs ont effectué des simulations à l’aide de plans d’expérience aléatoire dans lesquels l’unité de répartition était l’hôpital et les unités d’analyse étaient l’hôpital et le patient.

Résultats : Dans le cas des dates pré-déterminées, le risque d’annulation d’une intervention désignée comme hautement prioritaire équivalait au tiers du risque d’annulation dans le cas des rendez-vous accordés selon les listes d’attente (rapport de cotes 0,35; 95 % intervalle de confiance, 0,18–0,68). Après ajustement des facteurs « hôpital » et « patient », la probabilité hebdomadaire qu’un patient sur la liste d’attente subisse l’intervention était environ 20 % plus élevée pour les interventions de priorité moyenne (1,21; 1,18–1,24), après la date d’intervention pré-déterminée.

Conclusion : Les résultats indiquent qu’une nouvelle conception des processus de rendez-vous pourrait améliorer le rendement des services de chirurgie.

BOOKED ADMISSIONS HAVE BEEN SUGGESTED AS AN ALTERNATIVE METHOD for scheduling elective surgery (Ham et al. 2003). Instead of keeping patients on wait lists until there is an available slot in the operating room, consulting

surgeons pre-book the surgery date at the time of their decision to operate (McLeod et al. 2003). To clarify the impacts of pre-booking on access to care, we analyzed data from simulation experiments using a framework of intervention study (Sobolev and Kuramoto 2005). The process of scheduling surgery consists of allocating operating time to various surgical services (Blake et al. 2002), assigning blocks of operating time to surgeons (Blake and Donald 2002) and booking patients into the operating room slots of their respective surgeons (Dexter and Traub 2002). The booking determines the day of hospital admission when appropriate patient care is available (Hamilton and Breslawski 1994). It takes account of the availability of hospital resources and specialists' schedules.

In this analysis, we compared pre-booking and booking from wait lists in terms of cancellations originating with the hospital and time to surgery in the context of cardiac surgical care. Because booking surgery involves complex decision-making at the level of the hospital, we applied a cluster randomized design (Donner and Klar 1994) in which the unit of randomization was the hospital and the units of analysis were both the hospital and the individual patient (Ukoumunne et al. 1999). At the hospital level, the outcome was cancellation of one or more elective procedures with high priority from the final operating room schedule. At the patient level, the outcome was time between registration on a wait list and the operation.

We studied a setting in which weekly availability of surgeons for operations depended on their schedules for consultations, planned operations, on-call duties and vacations. Weekly operating room slots were divided between urgent and elective procedures and more urgent procedures might cause the cancellation of planned operations. Comparisons at the hospital level were used to assess whether pre-booking decreased the proportion of hospitals in which high-priority procedures were cancelled. Comparisons at the patient level were used to assess whether pre-booking improved patients' access to elective procedures.

In this paper, we applied the results of mapping cardiac services at a major teaching hospital in Canada, where the booked admissions program has long been in use (Sobolev et al. 2008).

Methods

Modelled peri-operative activities

We simulated the progress of individual patients through care steps using a discrete event model. The Appendix (available online @ <http://www.longwoods.com/product.php?productid=19896>) to this paper contains a description of the simulation approach, underlying assumptions and the values of the model parameters.

Each simulation run generated a series of updates in individual patient records in response to events produced by the modelled peri-operative activities (Table 1).

The patient records contained the occurrence and timing of simulated events, such as outpatient consultation, registration on the wait list and the operation itself, as well as cancellation or pre-operative death, if such occurred.

TABLE 1. Clinical and managerial activities included in the model

Activity	Function
Referral of elective patients for outpatient assessment	Patients presenting with symptoms are sent for consultation with surgeon in outpatient clinic
Registration of elective patients on appointment list	Details of referred patients are registered
Scheduling of elective patients for appointment	Time and duration of appointments are determined
Outpatient appointments for elective patients	Indication for operation is assessed (by surgeon)
Registration of elective patients on surgical wait list	Details of patients who require and decide to undergo the operation are registered
Pre-booking of elective patients for operation	Projected dates of operations within the upcoming 36-week period are determined after consultations (pre-booking)
Referral of patients requiring urgent specialist assessment	Patients requiring urgent assessment after angiography are referred (by cardiologist)
In-hospital assessment of patients requiring urgent treatment	Suitability of patients for admission to hospital as inpatients is determined (by on-call surgeon)
Registration of inpatients in surgical queue	Details are registered for patients who must undergo the operation and who are admitted directly to hospital
Scheduling of operating time	Inpatients and elective patients waiting for operation are identified, and hospital resources are reserved
Updating of operating room time	Final theatre schedule is created
Arrival of emergency patients	Patients requiring emergency operation are sent for procedure
Cancellation of scheduled operations by emergency arrivals	Emergency patients requiring immediate operation replace previously scheduled patients in the operating room schedule
Cancellation of scheduled operations by inpatients	Inpatients requiring surgery replace previously scheduled patients in the operating room schedule
Rescheduling of cancelled operations	Patients who are still waiting for operation after surgery was cancelled are identified, and hospital resources are reserved
Surgical procedures	Operation is performed, during which time patients have access to operating room resources
Discharge from hospital	Patients are prepared for post-operative care at home or in rehabilitation or community facilities

TABLE 1. Continued

Audit of wait lists	Names of patients who die while waiting for the operation are removed from surgical waiting lists
Allocation of appointment and theatre slots to surgeons	Appointment and theatre slots are allocated to surgeons according to duty rotation and vacation schedule for upcoming 18-week period

We modelled three care paths following angiography that patients with established coronary artery disease are likely to experience according to initial presentation and subsequent decisions leading to surgery: elective, inpatient and emergency, as reported elsewhere (Sobolev et al. 2006). The elective path applies to patients for whom surgical consultation and subsequent operation can be safely delayed. The inpatient path applies to patients admitted to hospital from the catheterization laboratory when urgent surgical assessment is necessary. The emergency path applies to patients requiring immediate surgical intervention. Patients referred for outpatient consultation are kept on the appointment list with a designated priority (high or low) until an opening for a clinic consultation becomes available. In the case of individual appointment lists, consultations are scheduled with the surgeon named in the referral. In the case of pooled appointment lists, consultations are scheduled with the first available surgeon.

After the consultation, the office of the consulting surgeon registers on the surgeon's wait list patients who require coronary revascularization, designating the required procedure as high-, medium- or low-priority, according to affected coronary anatomy and symptoms. The hospital's booking office books patients into operating room slots allocated to the consulting surgeon according to their priority and date of registration. In the case of wait list booking, booking is attempted weekly until a free slot is found. Because of prioritization, newly registered cases with higher priority delay scheduling of cases with lower priority already on the lists. In the case of pre-booking, cases are pre-booked for the next available slot for the upcoming 36-week period.

A draft schedule for the operating rooms is generated every Friday. In the case of wait list booking, the draft schedule lists procedures that have been booked from the wait lists and those booked for inpatients already waiting in hospital. In the case of pre-booking, the draft schedule lists procedures for pre-booked cases and for inpatients waiting in hospital. The schedule is finalized the following Monday and may be subsequently changed to reflect the arrival of inpatients and emergency patients. The availability of three surgeons for operations and consultations is coordinated through their weekly schedules such that, in any given week, one surgeon is on call (assessing inpatients and performing urgent operations), one performs planned operations and one conducts outpatient consultation. During weeks in which one surgeon is on vacation, the two remaining surgeons alternate call and planned duties, and no consultations are scheduled.

Experimental design

The experiment consisted of runs of the model with different algorithms for booking consultations and operations, and four additional two-level factors likely to influence model performance (method of allocating operating room slots, size of queues for out-patient consultation, elective surgery and inpatient surgery at the start of the simulation). Each run generated a group, or cluster, of patients served in a modelled hospital, with the cluster size being determined by the arrival and service rates, and by simulation time. We evaluated performance over a period of 108 weeks, which corresponded to three booking horizons of 36 weeks, or six 18-week cycles, of allocation of clinic and operating time to three surgeons.

As waiting times in a given hospital may be correlated, we used a cluster randomized design for intervention studies with a simulation run as the allocation unit (Sobolev and Kuramoto 2005). Before allocation to intervention groups, a random combination of the four factors was specified for each run (Cooper et al. 2002). The runs were then randomized to the four intervention groups: (1) individual appointment lists with pre-booking, (2) individual appointment lists with booking from wait lists, (3) pooled appointment lists with pre-booking and (4) pooled appointment lists with booking from wait lists.

In an intervention study, the sample size needs to be such that the evaluation is able to detect the anticipated effect of the intervention with a high probability. We estimated that 64 runs (i.e., modelled hospitals) per intervention group would have 90% power to detect a 15% difference in the proportion of runs that have cancellations of high-priority elective procedures for inferences at the hospital level in a two-sided 5% significance test (Kerry and Bland 1998a).

Dependence between outcomes in each hospital requires adjustment for within-hospital correlation at the design and analysis stage. We estimated that 256 runs would have 90% power to detect a 15% difference in the weekly operation rate between groups of patients in a two-sided 5% significance test (Kerry and Bland 1998b). Therefore, we had a full factorial 2^6 design with four replicates ($26 \times 4 = 104$) that allowed assessment of all main effects (Box et al. 1978). In calculating the sample size for inferences at the patient level, we estimated an average of 1,730 patient-weeks per simulation run and assumed a coefficient of variation for rates to be 0.25 (Donner and Klar 2000).

Statistical analysis

The outcomes for the intervention groups were compared at the level of the hospital, with application of regression methods to the hospital proportions, and at the level of the individual, according to formulas that were adjusted for within-hospital correla-

tion. The odds ratios (ORs) derived from logistic regressions measured the effect of pre-booking on the proportion of hospitals in which one or more elective procedures with high priority were cancelled (Hosmer and Lemeshow 1989). The ORs derived from discrete time survival regressions measured the effect of pre-booking on the weekly proportion of patients on the surgical wait lists who underwent the operation (Sobolev and Kuramoto, 2008). We used multivariate models to control for hospital and patient factors. For inferences at the hospital level, in addition to an indicator variable for the method of booking surgery, we entered indicator variables for the method of scheduling consultations (individual or pooled) and the method of allocating operating room slots (weekly or daily split between elective and urgent procedures), as well as indicator variables for the initial size of the queues for outpatient consultations (16 or 48), elective procedure (21 or 42) and inpatient procedure (0 or 16). For inferences at the patient level, we entered an additional indicator variable for the referral period during the simulation (weeks 1 to 54 or weeks 55 to 108) and a continuous variable for clearance time at registration (see Table 2). In the discrete time survival models, we also controlled for the weekly number of inpatient and emergency admissions, weeks on the wait list and within-hospital correlation (Sobolev et al. 2004).

TABLE 2. Priority, referral period and clearance time at registration on surgical wait list (as percentage of patients in each intervention group)

	Intervention group*			
	1 (n=49,747)	2 (n=49,919)	3 (n=50,632)	4 (n=49,957)
Priority group				
High	7.2	7.4	7.2	7.1
Medium	70.5	70.3	70.6	70.6
Low	22.3	22.4	22.2	22.3
Referral period during simulation				
1 to 54 weeks	52.9	53.0	52.1	52.3
55 to 108 weeks	47.1	47.0	47.9	47.7
Clearance time [†]				
Less than half a week	79.4	68.1	64.5	53.7
Half week to 1 week	20.0	26.8	33.6	36.8
More than 1 week	0.6	5.1	1.9	9.5

* (1) individual appointment lists, pre-booking; (2) individual appointment lists, booking from wait lists; (3) pooled appointment lists, pre-booking; (4) pooled appointment lists, booking from wait lists.

[†] Hypothetical time within which the wait list could be cleared at the maximum weekly service capacity if there were no new arrivals.

Results

The simulation generated 211,172 referrals for elective procedures, 196,275 inpatient and 15,007 emergency cases during 108 weeks in 256 hospitals. At registration on the surgical wait lists, about 70% of the cases had medium priority, and clearance time was one week or less for 98% of the elective procedures scheduled by pre-booking and for 92% of those booked through wait lists (Table 2). Some scheduled procedures were cancelled (9%); others did not occur by the time the study ended (1%).

The proportion of elective procedures with high priority that took place within one week of the treatment decision was 96.4% for pre-booking and 88.9% for wait list booking; 3.2% and 5.6%, respectively, of such procedures were cancelled from the final operating room schedule. The proportion of hospitals in which elective procedures with high priority had cancellations was 74.3% for pre-booking and 88.6% for wait list booking (Table 3). After adjustment for hospital factors, cancellation of high-priority elective procedures with pre-booking was only one-third as likely as for booking from wait lists (OR 0.35, 95% CI 0.18–0.68) (Table 3).

TABLE 3. Cancellation of high-priority procedures according to method of booking surgery*

	Proportion (95% CI)	Odds Ratio[†] (95% CI)
Wait list booking	88.6 (83.3, 93.8)	1.0
Pre-booking	74.3 (67.0, 81.5)	0.35 (0.18–0.68)

CI = confidence interval.

* Presented as proportions of hospitals and corresponding odds ratios (with 95% CI) in which at least one elective procedure with high priority was cancelled after the final operating theatre schedule was created.

[†] Adjusted for initial queue size at time of consultation, size of elective and urgent queues at registration on wait list, method of scheduling consultation and method of allocating theatre slots.

For patients needing medium-priority procedures, the average number of operations per week was 45.5 and 38.1 per 100 patients remaining on wait lists for pre-booking and wait list booking, respectively (Table 4); 9.5% and 10.2% of scheduled procedures, respectively, were cancelled from the final operating room schedule. After adjustment for hospital and patient factors, the weekly odds that a medium-priority patient on the wait list underwent the operation were 20% higher for pre-booking (OR 1.21, CI 1.18, 1.24) (Table 4).

For patients needing low-priority procedures, the average number of operations per week was 31.4 and 21.2 per 100 patients remaining on wait lists for pre-booking and wait list booking, respectively (Table 4); 5.1% and 8.1% of scheduled procedures, respectively, were cancelled from the final operating room schedule. After adjustment for hospital and patient factors, the weekly odds that a patient on the wait list would undergo the operation were more than two times higher for pre-booking (OR 2.13, CI 2.03, 2.22) (Table 4).

TABLE 4. Weekly proportion of patients on wait lists who underwent the operation with medium and low priority according to method of booking surgery*

	Medium priority		Low priority	
	No. of procedures (95% CI)	Odds Ratio ^{††} (95% CI)	No. of procedures (95% CI)	Odds Ratio ^{†§} (95% CI)
Wait list booking	38.1 (37.8, 38.4)	1.00	21.2 (20.9, 21.5)	1.00
Pre-booking	45.5 (45.2, 45.9)	1.21 (1.18, 1.24)	31.4 (30.9, 31.8)	2.13 (2.03, 2.22)

CI = confidence interval.

* Presented as the average number of procedures per week per 100 patients remaining on wait lists.

† Adjusted for initial queue size at time of consultation, size of elective and urgent queues at registration on wait list, method of scheduling consultation, method of allocating theatre slots, period of referral, emergency and urgent admissions, clearance time at registration and week from registration.

‡ Adjusted for exchangeable correlation within hospitals (0.0012).

§ Adjusted for exchangeable correlation within hospitals (0.0033).

Discussion and Conclusions

The total length of post-referral time for patients undergoing surgery is the sum of the time from referral to consultation and the time from consultation to surgery. However, the implications of different appointments and booking systems for access to care are poorly understood. In this study, we compared booking operations from wait lists and pre-booking surgery dates at the time of decision to operate by means of simulation experiments that allowed inferences at the levels of both hospital and patient (Ukoumunne et al. 1999).

We found that cancellations of elective procedures with high priority were less likely after pre-booking surgery dates and that within each priority group a larger proportion of patients on wait lists were likely to undergo an operation each week if procedures were pre-booked. Given that the weekly proportion of operations in relation to the size of the wait lists estimates the conditional probability of the operation taking place while waiting, the latter observation means shorter times to elective surgery (Sobolev et al. 2006). Higher cancellation rates after wait list booking may be attributable to a higher proportion of patients who need elective surgery being scheduled in the on-call slot with this method of booking, because of prioritization. Therefore, these patients are at higher risk of cancellation caused by the arrival of emergency patients or inpatients. Shorter time to surgery after pre-booking may be a result of scheduling cases in the order of booking requests; in contrast, with wait list booking, newly registered cases with higher priority delay scheduling of cases with lower priority already on the lists.

Others have used simulation experiments to explore the implications of different booking systems (Tuft and Gallivan, 2001). Contrary to our results, they suggested that an increase in cancellations of scheduled cases may be an unintended consequence of pre-booking. However, their analysis ignored factors relevant to the

underlying peri-operative process, including the weekly availability of specialists. The use of simulations for evaluating healthcare policy is based on two premises: first, that simulated individual care paths realistically represent the delivery of health services to a patient population and, second, that simulation produces care paths that are likely under the policy in question (Sobolev and Kuramoto 2005). Therefore, assessing the impacts of alternative booking systems should account for interaction between specialists' and hospitals' schedules. One previous analysis also did not account for interaction between appointments and booking systems (Gallivan et al. 2002), although the evidence suggested that the appointment system may influence the time to surgery (Vasilakis et al. 2007). Increasingly, health services research seeks to evaluate suggested changes in hospital care delivery (Hall et al. 2006). When possible, intervention studies are used to compare existing and proposed alternatives in management and policy. When organizational interventions are not feasible because of ethical, economic or other reasons, computer simulation provides an alternative method to quantify the effects of proposed changes in healthcare delivery. The results of our simulation experiments may have implications for policies on managing access to elective surgery in a network of hospitals. If the wait list size and the weekly number of inpatients vary significantly from hospital to hospital in a region, policy makers may consider redistribution of cases across hospitals. That would require a centrally managed pre-booking system. Our findings suggest that redesigning booking processes may improve the performance of surgical services.

In this study, we evaluated two methods of booking elective surgery using specifications of peri-operative activities that constitute the process of cardiac surgical care. Because these managerial and clinical activities are generic across surgical services (Table 1), the results of our evaluation may be applicable to other settings in which wait lists are used to manage access to surgical procedures in hospital. Indeed, by varying other factors that are likely to influence service performance, such as method of allocating operating room slots and method of scheduling clinic appointments, we were able to delineate the independent effect of booking methods. In addition, the delivery of surgical services was simulated over six cycles of allocation of clinic and operating time to maximize variation in the dependent variables and, therefore, to increase the precision of our estimates. However, some limitations of our model should be recognized in assessing our results. For example, although we were able to account for availability of surgeons for operations, fluctuations in availability of hospital staff and intensive care beds were not considered in the model because of lack of information about policies for cancellation due to staff shortage and bed blockage.

Further research is required to explore the implications of booking systems on patient flow, specifically, the impact of the ratio of slots allocated for urgent and elective procedures on time to surgery for patients needing procedures urgently; the

implications of policies for postponement or cancellation of elective procedures and re-scheduling cancelled surgeries in relation to time to surgery; and the effects of the order of elective procedures on a given day, patient segmentation, the partitioning of inpatient and outpatient facilities, and dedicated operating rooms. Other remaining questions include whether successful management solutions developed in one hospital can be transferred to other institutions.

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ONLINE EXCLUSIVES**Program Design and Long-Run Costs of a National Catastrophic Drug Insurance Plan****Conception et coûts à long terme d'un programme national d'assurance médicaments pour les cas de prix exorbitants**

HAI ZHONG

Abstract

There are strong arguments that national catastrophic drug insurance should be established in Canada with assistance from the federal government. The author of this paper projects the long-run program costs for two proposals for such a program: that of the Kirby Committee and that of the Romanow Commission. He concludes that both the annual program costs to the federal government and the share of the federal government on total prescription drug expenditures in Canada would increase dramatically under either program. Although the Kirby-style program requires less initial expenditure by the federal government than does the Romanow-style program, because of their different designs, over time the Kirby-style program would become more expensive. Moreover, the Kirby-style program would be more sensitive to the growth rate of prescription drug expenditure. The choices relating to the program threshold and federal cost-sharing rate have far-reaching influences on the long-run costs to the federal government.

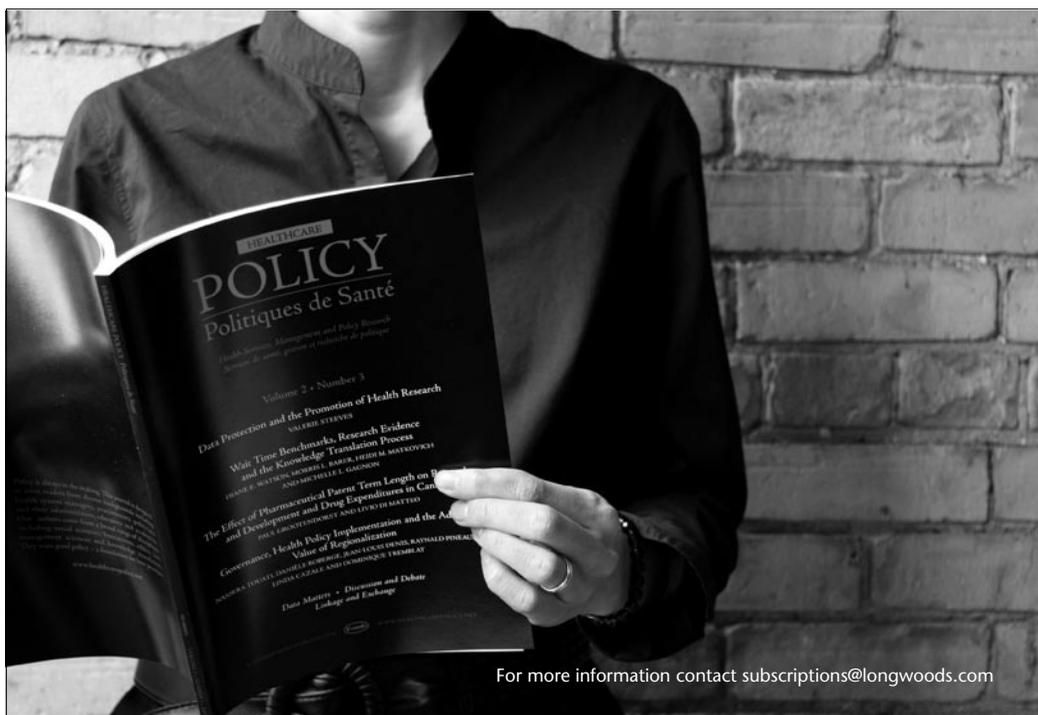
Résumé

Il y a de nombreux arguments en faveur de l'établissement, au Canada, d'un régime national d'assurance médicaments pour faire face aux situations où les coûts des médicaments d'ordonnance sont exorbitants; régime qui se ferait avec la participation du gouvernement fédéral. L'auteur de l'article projette les coûts à long terme d'un tel programme en fonction de deux propositions en ce sens : celle du rapport Kirby et celle du rapport Romanow. L'auteur conclut que les coûts annuels du programme pour le gouvernement fédéral et que la part du gouvernement au total des dépenses pour les médicaments d'ordonnance au Canada augmenteraient considérablement dans le cas des deux programmes proposés. Bien que le programme de Kirby nécessite moins de dépenses initiales de la part du gouvernement fédéral que le programme de Romanow, en raison des différences de conception, à la longue le programme de Kirby serait plus

coûteux. De plus, le programme de Kirby serait plus sensible à la croissance des taux de dépense pour les médicaments d'ordonnance. Les choix quant au seuil-limite et au taux de partage des frais du gouvernement fédéral ont une profonde influence sur les dépenses à long terme pour le gouvernement.

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ONLINE EXCLUSIVES

**Adapting the Balanced Scorecard for Mental Health and Addictions:
An Inpatient Example****Adapter le tableau de bord prospectif aux services de santé mentale et de
toxicomanie : l'exemple des patients hospitalisés**

ELIZABETH LIN AND JANET DURBIN

Abstract

The Balanced Scorecard (BSC) is a performance-monitoring framework that originated in the business sector but has more recently been applied to health services. The province of Ontario is using the BSC approach to monitor quality of inpatient care in five service areas. Feasibility of the scorecard framework for each area has been assessed using a standard approach. This paper reports results of the feasibility study for the mental health sector, focusing on three issues: framework relevance, underlying strategic goals and indicator selection. Based on a literature review and extensive stakeholder input, the BSC quadrant structure was recommended with some modifications, and indicators were selected that aligned with provincial mental health reform policy goals. The mental health report has completed two cycles of reporting, and has received good support from the field.

Résumé

Le tableau de bord prospectif (TBP) est un cadre de suivi du rendement qui provient du secteur des affaires et qui a été récemment adopté dans les services de santé. L'Ontario utilise les TBP pour surveiller la qualité des services aux patients hospitalisés pour cinq types de services. La faisabilité du cadre de travail des TBP a été évaluée pour chaque service au moyen d'une approche normalisée. L'article fait état des résultats de l'étude de faisabilité pour le secteur de la santé mentale, touchant trois enjeux : la pertinence du cadre de travail, les objectifs stratégiques sous-jacents et le choix des indicateurs. À la suite d'une revue de la littérature et de nombreuses informations recueillies auprès des parties prenantes, la structure à quadrants des TBP a été recommandée avec quelques modifications et des indicateurs ont été choisis en correspondance aux objectifs de réforme politique de la province en matière de santé mentale. Le rapport sur la santé mentale a franchi deux étapes de son cycle et a reçu un appui favorable de la part du secteur concerné.

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Analysis of International Migration Patterns Affecting Physician Supply in Canada

Analyse des schémas de migration internationale et
de leur influence sur la disponibilité de médecins
au Canada



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Abstract

This paper analyzes the migration patterns of both Canadian medical school graduates and international medical graduates (IMGs), and the impact of these patterns on physician supply in Canada. Immigration patterns of IMGs have changed over time, with fewer physicians from the United Kingdom and more from South Africa. A large portion of IMGs who leave Canada (43%) return “home.” Recently, the average duration of practice in Canada for these doctors has been three years, a finding that suggests many came for educational purposes or to acquire skills. The heterogeneity and complexity of international migration are highlighted in this paper.

Résumé

Cet article analyse les schémas de migration des diplômés en médecine d'écoles canadiennes et de ceux venant de l'étranger, et étudie l'impact de ces schémas sur la disponibilité de médecins au Canada. Les schémas d'immigration des diplômés de l'étranger se sont modifiés au cours des années : moins de médecins proviennent du Royaume-Uni et plus viennent de l'Afrique du Sud. Une grande part des diplômés de l'étranger quittent le Canada (43 %) pour retourner au pays où ils ont obtenu leur diplôme. Récemment, le temps moyen de pratique au Canada pour ces médecins était de trois ans, donnée qui suggère que plusieurs d'entre eux sont venus pour obtenir une formation ou acquérir des compétences. L'hétérogénéité et la complexité de la migration internationale sont mis en relief dans l'article.

In CANADA, DISCUSSION ON THE INTERNATIONAL MIGRATION OF PHYSICIANS is typically focused on two issues – “brain drain” from Canada and the ethics of recruiting doctors offshore. Canada’s position in the global workforce can be aided by better understanding the flows in and out of the country. Do we primarily gain from a few countries of the world? Have these countries changed over time? What proportion of our physicians do we lose to countries other than the United States? Do international medical graduates (IMGs) return home?

The Canadian Institute for Health Information (CIHI) reports annually on the number of physicians moving abroad and returning to active practice in Canada (CIHI 1996–2005). In the early to mid-1990s, net losses averaged 400 per year. More recently, the number of physicians leaving Canada has decreased significantly, resulting in net gains of between 30 to 60 per year.

A study of Canadian physicians practising in the United States showed that there are many professional and personal push and pull factors (McKendry et al. 1996). Results of a similar 2007 survey confirmed many of the influences causing physicians

to emigrate and identified potential incentives for returning (Buske 2007).

A study that tracked the Canadian medical graduating class of 1989 six years later found that 11% were either in practice, in training or inactive outside Canada (Ryten et al. 1998). Similar statistics for the 2000 postgraduate exiting cohort show that 94% were in Canada two years later and 92% were there five years later. The 1995 cohort showed 89% retention 10 years later (CAPER 2003 and 2007).

Less has been published with respect to physicians immigrating to Canada and achieving licensure to practise either through pre-arranged employment or temporary employment authorizations (Barer and Webber 1999). The latter category in particular is problematic, given that one individual may be counted a number of times when the physician's authorization is renewed. In a paper on international migration patterns of physicians, the number of IMGs was reported by source and receiving country (Mullan 2005). These findings, however, are based on aggregate supply and do not take into account when the IMG became licensed to practise in Canada.

The purpose of this study is to look at migration patterns of IMGs immigrating to Canada and the pattern of physicians leaving Canada, both Canadian medical graduates (CMGs) and IMGs.

Data Source/Methods

The Canadian Medical Association (CMA) has developed a comprehensive database that is intended to capture all licensed physicians in Canada. It is updated continually with information from certifying bodies, licensing bodies, provincial/territorial medical associations and individual physicians. It contains such information as name, address, age, sex, school and year of graduation, certified specialty, language and so on. Those who may have an educational licence while undertaking postgraduate medical education are in the database, but they and visa trainees are omitted from this study.

The CMA multi-year Masterfile is created from compiling annual point-in-time (January) snapshots of the physician database and adding the following tracking variables:

- Ever abroad
- Age went abroad
- Returned from abroad
- Age returned from abroad
- Destination country if went abroad
- Destination country was place of MD graduation

Every physician who was ever abroad between 1995 and 2005 is included in this study. This includes both Canadian graduates who have emigrated and IMGs who

immigrated to Canada and subsequently left. Those who returned to Canada during this period but originally left before 1995 are excluded.

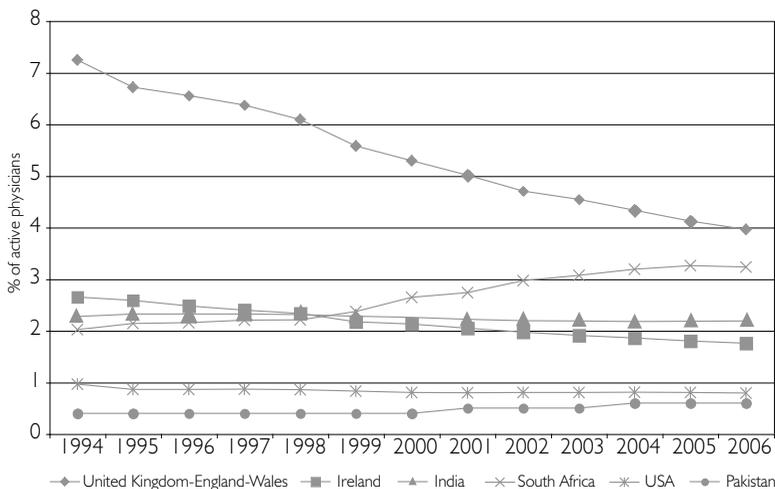
One of the major limitations of the data is their quality with respect to migrating physicians who are not members of the CMA. An out-of-country address is typically provided by the individual physician or by the physician's prior Canadian office or hospital. Between 200 and 300 non-members per year are removed from the active counts because of the absence of a valid Canadian address. Unless a non-Canadian address is verified, the physician cannot be classified as abroad even though this may be the case. It is likely that the abroad counts presented below are understated.

Results

Immigration of international medical graduates

The country of MD graduation of IMGs first licensed in Canada is changing. The largest numbers of physician immigrants in the past decade are graduates from South Africa, the United Kingdom, India, Saudi Arabia, Egypt and Pakistan. The migration patterns of the past decade (1995–2005) have shifted away from the United Kingdom and Ireland towards graduates of Saudi Arabia, Pakistan and South Africa. The current mix is the result of new immigrants and the retirement of earlier immigrant physicians. Over the past decade, UK physicians decreased from 7.2% to 4% of active physicians in Canada, graduates from Ireland from 2.6% to 1.8% and US graduates from 1.0% to 0.8%, while South African graduates increased from 2% to 3.2% (Figure 1). The annual numbers of new immigrant South African graduates, however, decreased from 200 in 2001 to 74 in 2005.

FIGURE 1. Active IMGs in Canada, by country of graduation



Source: CMA Multiyear Masterfile, 2006.

Out-migration of licensed Canadian physicians

Since the CIHI migration data do not track exit and re-entry on a cohort basis, it is not possible to know the length of time between exit and return. The CMA's multi-year file tracked mobility of physicians over a 10-year period, 1996 to 2005. Of those who left in 1996 and 1997, 33% and 34% had returned by 2005 and approximately 80% of those returning did so within five years.

CANADIAN MEDICAL GRADUATES

Where do Canadian medical graduates go when they leave Canada? Between 1995 and 2005, the CMA Masterfile reported a loss of 2,869 practising physicians who were graduates of Canadian medical schools, 2,323 (80%) of whom went to the United States. A considerably smaller number went to Saudi Arabia (91) and other Middle Eastern countries (82). A small number migrated to Commonwealth countries (UK 53, Australia 47 and New Zealand 34), to Europe (39) and Hong Kong (22).

INTERNATIONAL MEDICAL GRADUATES

Based on survey data (CFPC et al. 2004), in most respects, IMGs practise in a similar fashion to CMGs, especially once they are well established. But when it comes to out-migration from Canada, they demonstrate a different behaviour pattern than their CMG colleagues. Many return to the country or region where they received their medical degrees (Table 1). Between 1995 and 2005, a total of 1,146 IMGs, representing less than 1% of all practising IMGs in any given year, left Canada, 61% (696) licensed prior to 1995 and 39% (450) licensed between 1995 and 2005.

TABLE 1. IMGs who left Canada, 1995–2005

Country of graduation	IMGs licensed before '95			IMGs licensed '95–'05			All IMGs		
	Left Canada	Returned home	Returned home (%)	Left Canada	Returned home	Returned home (%)	Left Canada	Returned home	Returned home (%)
UK/Wales/Ireland	254	102	40.2	53	21	39.6	307	123	40.1
USA	50	40	80.0	27	24	88.9	77	64	83.1
Australia/New Zealand	25	15	60.0	17	14	82.4	42	29	69.0
South Africa	96	37	38.5	92	58	63.0	188	95	50.5
Other African countries	5	1	20.0	7	0	0.0	12	1	8.3

TABLE 1. Continued

Asia	17	10	58.8	21	8	38.1	38	18	47.4
Southeast Asia	11	1	9.1	9	1	11.1	20	2	10.0
India/Pakistan/Sri Lanka	58	6	10.3	52	6	11.5	110	12	10.9
Central America/Caribbean	26	3	11.5	10	0	0.0	36	3	8.3
South America	21	10	47.6	8	3	37.5	29	13	44.8
Europe	51	15	29.4	25	10	40.0	76	25	32.9
Eastern Europe	21	3	14.3	24	0	0.0	45	3	6.7
Saudi Arabia	18	18	100.0	69	59	85.5	87	77	88.5
Other Middle Eastern	43	20	46.5	36	7	19.4	79	27	34.2
Total	696	281	40.4	450	211	46.9	1,146	492	42.9

Source: CMA Multiyear Masterfile, 2006.

Overall, 43% of this group returned “home,” i.e., to the country where they received their medical degree or to a neighbouring country without a medical school. Just over 40% of the group initially licensed in Canada before 1995 who left between 1995 and 2005 returned home, and this number increased to 47% for those initially licensed between 1995 and 2005.

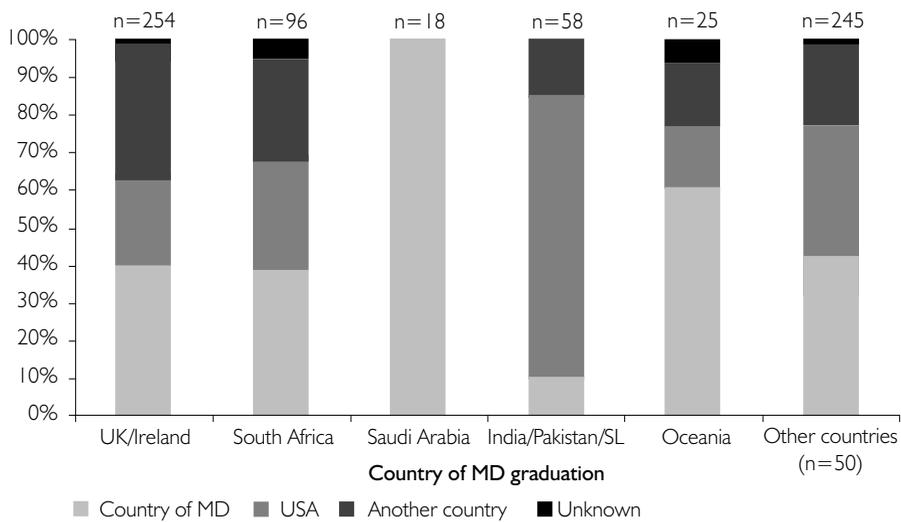
Of the overall established cohort of IMGs, almost 700 were licensed before 1995 and left Canada between 1995 and 2005. Depending on the country of MD graduation, different patterns emerge (Figure 2). For example, 10% of Indian/Pakistani/Sri Lankan graduates returned to their country of MD graduation, while close to 80% went to the United States. In contrast, 60% of Australian and New Zealand graduates returned to their country of MD graduation (Oceania), and only 16% went to the United States. Virtually all the Saudi Arabian graduates and 38.5% of South African graduates returned home.

Of the more recently licensed IMGs (1995–2005) who left between 1995 and 2005 (450), 46.9% returned to the country where they received their MD degree (Figure 3). Their average duration between licensure in Canada and departure was three years. A high percentage of those IMGs returning home were graduates from the United States (89%), Oceania (82%), Saudi Arabia (86%), Hong Kong (64%) and South Africa (63%).

Analysis of International Migration Patterns Affecting Physician Supply in Canada

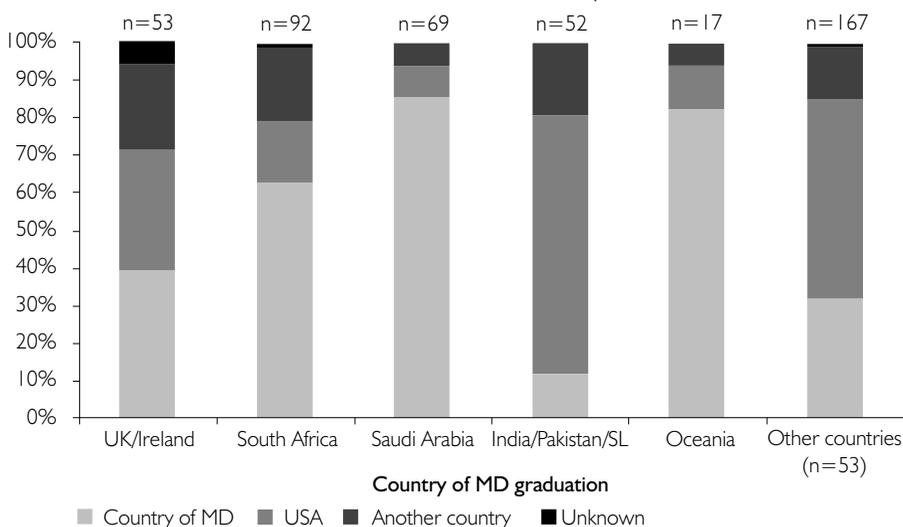
If they did not return home, where did they go? About half (48%) the entire cohort of IMGs who left Canada returned to or near their country of graduation, 34% moved to the United States and 17% moved to another country. A high percentage of graduates of the following countries emigrated from Canada to the United States: Eastern Europe (96%), Central America and Caribbean (90%), China (89%), India/Pakistan/Sri Lanka (69%) and Middle East (61%).

FIGURE 2. IMGs who moved abroad between 1995 and 2005 (licensed before 1995)



Source: CMA Multiyear Masterfile, 2006.

FIGURE 3. IMGs who moved abroad between 1995 and 2005 (licensed between 1995 and 2005)



Source: CMA Multiyear Masterfile, 2006.

Discussion

Canadian physicians are well qualified both from an academic and a clinical perspective and are highly regarded by the rest of the world, especially the United States, with whom Canada shares a joint accreditation system for recognition of undergraduate medical degrees. With projected shortages in the United States of up to 200,000 physicians by 2020, pressure from recruiters to entice Canadian physicians to emigrate is expected to increase (Cooper 2004).

While the out-migration of Canadian medical graduates has been declining, for those leaving, the United States is still the destination for 80% of them. The CMA data show that at least a third of them return, and 80% of those returning do so within five years of departure, suggesting that this group left Canada to acquire further training and experience.

The World Health Organization (WHO) recently identified 57 countries that are facing severe health-sector shortages. There is thus a strong need for countries to keep the healthcare workers they have trained (WHO 2006). Canada's recent increases in undergraduate medical school enrolment (AFMC 2007) and its commitment to ethical international recruitment policies may lessen its dependency on IMGs.

IMGs do not necessarily remain on a permanent basis after their initial licensure in Canada. Of those who leave Canada, about 40% of established IMGs, initially licensed in Canada prior to 1995, and about 50% of recent IMGs, first licensed in Canada between 1995 and 2005, returned to their home or neighbouring countries after an average of three years in Canada, suggesting that this group came to Canada for training, skills development or practice experience to complement their prior knowledge.

Despite the failure of the CMA Masterfile to capture all physicians who go abroad, the proportional findings of this study are likely to reflect the general pattern. It would be interesting to continue to follow patterns of migration over a longer period of time. Also of value would be a study of those IMGs who came to Canada for a period and then left but did not return home. Did they stay in their next destination, or was that another stepping-stone before returning home?

Conclusion

International migration of physicians is a heterogeneous and complex process driven by varied motives. Contrary to some beliefs, mobility is not necessarily a one-time move or a one-way passage to a desired destination, nor is it always a case of a developed country raiding and poaching developing countries.

Although recruitment must be based on an ethical philosophy and set of values, we must understand the life cycle of physician migration and its benefits to capacity building and humanitarian service. Some of the data presented here speak to global capacity building of physicians – a willingness to share knowledge, skills and experi-

ence with those who need it so that many, not just a few, may benefit. We need to ensure that well-meaning protective policies developed during either oversupply or undersupply crises do not lead to unintended consequences that limit mobility of physicians for opportunities to learn and to acquire skills and knowledge they need in their home countries. This study illustrates that while Canada is the fortunate recipient of many international medical graduates, not all relocate to Canada permanently and, like many Canadian-born physicians, are simply benefiting from the educational opportunities and experiences offered in a foreign country.

A recent paper by Fitzhugh Mullan (2007) reports that in 2006, 27% of graduating US medical students had worked abroad, double the proportion of a decade earlier. He suggests that a commitment by the United States to mobilize healthcare workers for service abroad would benefit not just the patients and professionals, but also underscore US commitment to the global community and act as compensation for the benefit the United States has gained from internationally trained physicians.

Physicians do practise and live in a global village, and opportunities to share and learn from one another raise awareness, expand vision and generate global compassion and, hopefully, shared solutions.

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Program Design and Long-Run Costs of a National Catastrophic Drug Insurance Plan

Conception et coûts à long terme d'un
programme national d'assurance médicaments
pour les cas de prix exorbitants



by HAI ZHONG

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Abstract

There are strong arguments that national catastrophic drug insurance should be established in Canada with assistance from the federal government. The author of this paper projects the long-run program costs for two proposals for such a program: that of the Kirby Committee and that of the Romanow Commission. He concludes that both the annual program costs to the federal government and the share of the federal government on total prescription drug expenditures in Canada would increase dramatically under either program. Although the Kirby-style program requires less initial expenditure by the federal government than does the Romanow-style program, because of their different designs, over time the Kirby-style program would become more expensive. Moreover, the Kirby-style program would be more sensitive to the

growth rate of prescription drug expenditure. The choices relating to the program threshold and federal cost-sharing rate have far-reaching influences on the long-run costs to the federal government.

Résumé

Il y a de nombreux arguments en faveur de l'établissement, au Canada, d'un régime national d'assurance médicaments pour faire face aux situations où les coûts des médicaments d'ordonnance sont exorbitants; régime qui se ferait avec la participation du gouvernement fédéral. L'auteur de l'article projette les coûts à long terme d'un tel programme en fonction de deux propositions en ce sens : celle du rapport Kirby et celle du rapport Romanow. L'auteur conclut que les coûts annuels du programme pour le gouvernement fédéral et que la part du gouvernement au total des dépenses pour les médicaments d'ordonnance au Canada augmenteraient considérablement dans le cas des deux programmes proposés. Bien que le programme de Kirby nécessite moins de dépenses initiales de la part du gouvernement fédéral que le programme de Romanow, en raison des différences de conception, à la longue le programme de Kirby serait plus coûteux. De plus, le programme de Kirby serait plus sensible à la croissance des taux de dépense pour les médicaments d'ordonnance. Les choix quant au seuil-limite et au taux de partage des frais du gouvernement fédéral ont une profonde influence sur les dépenses à long terme pour le gouvernement.

THE CANADA HEALTH ACT DOES NOT APPLY TO PRESCRIPTION DRUGS used outside the hospital setting. Coverage for prescription drugs in Canada is offered through a mixture of public and private insurance plans, both of which vary significantly in terms of eligibility, co-insurance rate, deductibles and drug formulary. Many Canadians have no coverage at all. According to estimates by the Fraser Group and Tristat Resources (2002), 2% of Canadians (600,000) do not have any sort of prescription drug coverage. Nine per cent of Canadians have drug coverage plans without caps on out-of-pocket costs. In total, 11% of Canadians are estimated to be at substantial financial risk from high prescription drug expenses paid out of their own pockets.

Prescription drugs have become an increasingly important component of health-care services. Between 1975 and 2004, per capita prescription drug expenditure rose from \$119 to \$562 (in 2004 constant dollars), and spending on prescribed drugs as a proportion of total health expenditure has increased from 6.3% to 13.8% (CIHI 2005a,b). Prescription drug spending has increased at a more rapid rate than any other component of health expenditure.

For many individuals and families in Canada, financial hardship resulting from high prescription drug expenses and lack of adequate insurance protection is an increasing risk. In contrast, many OECD countries provide publicly funded coverage for prescription drugs as well as for hospital and physician services (Kirby 2002). Therefore, in both the report by the Standing Senate Committee on Social Affairs, Science and Technology (Kirby Committee) and the report by the Commission on the Future of Health Care in Canada (Romanow Commission), there are strong arguments that the principles of the *Canada Health Act* should be extended to prescription drugs used outside the hospital setting (Kirby 2002; Romanow 2002). Latterly, at the 2004, 2005 and 2006 Council of the Federation meetings, the premiers of all Canadian provinces and territories consistently called on the federal government to take steps to ensure that all Canadians have access to the drugs they need when they need them. At the September 2004 meeting of First Ministers, the federal government agreed that health ministers be directed to establish a Ministerial Task Force (MTF) to develop and implement a national pharmaceutical strategy. In September 2006, the MTF released the National Pharmaceuticals Strategy Progress Report, which provides a snapshot of progress to date and MTF recommendations on the development and implementation of the multi-year National Pharmaceuticals Strategy (NPS).

At present, the national catastrophic drug plan is still being developed. Available options include proposals in the Kirby Report, the Romanow Report and the National Pharmaceuticals Strategy Progress Report (Kirby 2002; Romanow 2002; Health Canada 2006). Table 1 provides a summary of the basic features of the three proposals.

All three proposed programs share some common design features. Although they make different choices about the level of the catastrophic threshold and sharing rate of involved payers, all three assume that in the future the public sector will be willing to undertake a certain responsibility for catastrophic prescription drug expenditures.

While all three proposed programs have a common ultimate goal – protecting Canadians from catastrophic drug expenditures – they offer different approaches to reach it. The NPS and Kirby programs directly target individuals in Canada. The Romanow program recommends establishing a national catastrophic drug transfer. This new transfer would assign funds to provincial/territorial drug plans to help them cover high prescription drug costs. In return for this increased federal transfer, provinces and territories would be expected to expand their coverage and to reduce disparities across the country.

While both the Kirby and Romanow proposals clearly specify the financial responsibility of the key players in the proposed programs, there is no role for private drug plans in the Romanow program. The National Pharmaceuticals Strategy Progress Report (Health Canada 2006) emphasizes that one of the focuses of the NPS in the next stage is the role of engaged stakeholders.

At the stage of designing the structure for a national program, cost is an impor-

tant concern. In all three proposals, the annual program cost for the first year has been estimated. In the Kirby Report, the estimated initial annual cost of the proposed program to the federal government at 2000 was \$500 million. In the Romanow Report, the estimated initial annual cost of the proposed program to the federal government at 2000/01 was \$749.1 million to \$1.01 billion. To demonstrate the impact of maintaining private insurance coverage, the NPS cost estimates for each threshold option have been provided both with and without a private insurance role in paying catastrophic drug costs. The annual cost for the catastrophic drug coverage (CDC) ranges from \$6.6 billion to \$10.3 billion. (The CDC costs estimated under each of the CDC options include both current and new public dollars – paid by federal and provincial drug plans – that would potentially be needed to reimburse costs above a given CDC threshold.)

TABLE 1. A summary of proposals on national catastrophic drug insurance

	Population covered	Program threshold	Payers	Payer's share
Kirby proposal	Universal	<ul style="list-style-type: none"> • 3% household income for all individuals • 3% household income or \$1,500 for individuals with private drug plans 	<ul style="list-style-type: none"> • Federal government • Provincial public drug plans • Private drug plans 	<ul style="list-style-type: none"> • Federal government: 90% of the cost exceeding \$5,000 • Provincial drug plans: 10% of the cost exceeding \$5,000, and 100% of the cost between 3% income and \$5,000 • Private drug plans: 10% of the cost exceeding \$5,000, and 100% of the cost between \$1,500 and \$5,000
Romanow proposal	Members of provincial public drug plans	<ul style="list-style-type: none"> • \$1,500 	<ul style="list-style-type: none"> • Federal government • Provincial public drug plans 	<ul style="list-style-type: none"> • Federal government: 50% of the cost exceeding \$1,500 • Provincial drug plans: 50% of the cost exceeding \$1,500
NPS proposal	Universal	<ul style="list-style-type: none"> • Option 1 – Variable percentage: 0/3/6/9% of family income • Option 2 – Fixed percentage: 4.3% of family income 	<ul style="list-style-type: none"> • Not specified 	<ul style="list-style-type: none"> • Not specified

However, none of these reports considers the long-run costs of these programs. Cost is a crucial determinant of long-run sustainability for such a program, and the costs of these proposed programs will not remain fixed in the long run. Prescription drug expenditure has increased rapidly in the past few decades, and this trend may continue in the future. Rising drug expenditure generates great financial pressure on provincial drug plans, private drug plans and individuals. Under a national catastrophic drug insurance plan, a certain amount of this financial pressure would be transferred to the federal

government, and there would be a reallocation of financial responsibility for prescription drugs among provincial drug plans, private drug plans and individuals. The different design of each plan would generate different future paths for program expenditures.

The purpose of this study is to project the long-run costs to the federal government under the Kirby- and Romanow-style programs. Because of lack of information on current provincial and private drug coverage, we cannot project other public and private costs under the two proposed programs. This lack of information may be the reason why the Kirby and Romanow reports provide only cost estimates for the federal government under the proposed programs. However, the present study will still offer useful information for the shaping of a national catastrophic drug insurance plan. First, the costs to the federal government over time under the proposed programs will be crucial to their long-run sustainability. Secondly, this study explores the cost implications of different features of program design, including the eligibility threshold for federal cost-sharing and the cost-sharing rate. As shown in Table 1, the Kirby program and the Romanow program make different choices about the key parameters of program design – catastrophic threshold and federal cost-sharing rate. While the Kirby program chooses a high threshold and a high rate of cost-sharing, the Romanow program chooses a low threshold and a low rate of cost-sharing. These different approaches have different cost-sharing implications for the involved parties: the federal government, the provincial/territorial drug plans, private drug plans and individuals. The National Pharmaceuticals Strategy Progress Report (Health Canada 2006) emphasizes that the next stage of the NPS will focus on plan design, sustainability considerations and the role of engaged stakeholders. The results of this study may provide useful information on these aspects.

Method

The Fraser Group and Tristat Resources have estimated the first-year annual cost to the federal government for the Kirby-style program to be \$500 million (based on 2000). This estimate is based on the Fraser Group's proprietary database of private sector drug plans, the Survey of Labour and Income Dynamics (SLID) and the Survey of Work Arrangements (SWA).

The Romanow Commission asked the Manitoba Centre for Health Policy (MCHP) to provide a detailed analysis of drug costs for the province of Manitoba in recent years. The MCHP (2002) analysis is based on the Manitoba database maintained by the Health Information Service (Manitoba Health). The Romanow Commission then extrapolated the Manitoba data to the rest of Canada based on a number of assumptions. Details on the extrapolation are not disclosed. According to the extrapolation, the estimated annual cost to the federal government of the National

Catastrophic Drug Transfer could range from \$749.1 million to \$1.01 billion at the base year, 2000/01.

Without access to the Fraser Group's proprietary database and details on the extrapolation by the Romanow Commission, we are unable to project the program costs based on micro-data. However, we can calculate the projections with aggregate data, using assumptions regarding the underlying distribution property of prescription drug expenditure and a Monte Carlo simulation.

The projection methods for the Kirby- and Romanow-style programs are very similar. In the year 2000, the cost of a particular program to the federal government could be written in the following way:

$$C_{2000} = \sum_i (c_i - threshold) * p \tag{1}$$

where C_{2000} is the annual program cost in 2000; c_i is the annual prescription drug expenditure of an individual who is eligible for the program and had prescription drug costs more than the program threshold in 2000; p is the percentage that the federal government would pay if an individual's prescription drug expenditure exceeded the threshold. Equation (1) could be rewritten as follows:

$$C_{2000} = p * [N_{2000} * ((\bar{c}_{2000} | c > threshold) - threshold)] \tag{2}$$

In equation (2), N_{2000} is the number of individuals who are eligible for that program and had prescription drug costs greater than the program threshold in 2000; $\bar{c}_{2000} | c > threshold$ is the average prescription drug expenditure of that group of people. In a given year in the future, the annual program cost could be written as

$$C_t = p * [N_t * ((\bar{c}_t | c > threshold) - threshold)] \tag{3}$$

To predict the annual program cost for a program in year t , we need to predict N_t and $\bar{c}_t | c > threshold$ for that program.

Assumptions for the projection

Assumption 1: The individual prescription drug expenditure conditional on positive use has a log-normal distribution.

Usually the distribution of drug expenditure is right skewed with a long tail. Many individuals have low drug expenditure; a few have relatively high drug expenditure. Many studies (e.g., Duan 1983; Duggan 2005; Leibowitz et al. 1985; Manning et al. 1987; Street et al. 1999) show that the medical expenditure data are log-normally dis-

tributed conditional on positive use. The logarithm function tends to squeeze together the larger values and stretches out the smaller values.

Assumption 2: The proportion of Canadians who have positive drug use in year 2000 is 68%, and it increases at 1% per five years so that the proportion ends up at 75% of the population at the end of the projection.

In year 2000, 68% of Manitobans had taken at least one prescription drug (MCHP 2002). Since data for Canada as a whole are not available, we assume the same percentage as in Manitoba. In recent years, many new medications have been introduced, many for conditions that previously had no drug therapy. Moreover, in the next few decades Canada's population will experience a higher proportion of senior citizens as the baby boom generation ages. The aging of this demographic cohort may increase drug consumption (Morgan 2005). Assumption 2 reflects these trends.

Assumption 3: The mean of individual annual prescription drug expenditure in Canada increases at the average historical rate based on the trend in the past two decades.

The average annual growth rate of per capita prescription drug expenditure from 1985 to 2004 was 8.5%, deflated by the Consumer Price Index (CPI) (CIHI 2005a). In the literature of cost projection, it is normal to use history as the middle level and do sensitivity checks with a value above and a value below. Therefore, we will also include two other scenarios whereby the mean prescription drug expenditure in Canada increases at 9.5% and at 6.5% annually. Health expenditures have increased dramatically in recent years worldwide. If they continue to grow at the historical rate, the health-care system will be difficult to sustain in the near future. Therefore, cost containment will be a likely priority for governments in the next few decades (OECD 2006). The assumption of a 6.5% growth rate tries to capture the effect of future cost containment. Several developed countries (e.g., France, Germany and Switzerland) have successfully kept this rate below 6.5% in the past few decades (CIHI 2005a, 2007).

Assumption 4: In 2000, we denote the variable on the log of individual prescription drug expenditure as z . The mean of the underlying log-normal distribution is μ and the variance is σ^2 , which is $z \sim [\mu, \sigma^2]$. In a given year in the future, we denote the variable on the log of individual prescription drug expenditure as z' . We assume that z' is distributed as k^*z . This is an assumption about the shape of the distribution over time. We assume that the distribution in the future is proportional to the distribution in 2000. The mean of the underlying log-normal distribution will be $k^*\mu$ and the variance will be $k^{2*}\sigma^2$, which is $z' \sim [k\mu, k^2\sigma^2]$. Assumption 4 can be supported by a case study using Ontario Drug Benefit (ODB) data, which is presented in Appendix 1.

Projection of N_t

In this step, we first project the proportion of Canadians whose prescription drug expenditure exceeds the program threshold in a given year. Secondly, we determine the number of Canadians who are eligible for the proposed program in a given year.

The basic idea of the first substep is as follows (details of the calculation are reported in Appendix 2): We assume that the prescription drug expenditure is log-normally distributed conditional on positive drug use (Assumption 1), and we know the mean of the log-normal distribution in 2000. We also know the proportion of Canadians whose prescription drug expenditure exceeds the program threshold in 2000. With the latter condition, we can estimate the variance of the underlying distribution, i.e., determine the variance. In a given year in the future, we assume that the prescription drug expenditure is still log-normally distributed. Using Assumption 3, we know the mean of the underlying distribution. And using Assumption 4, we can find out the variance of the distribution in that year. Based on these conditions, we can determine the proportion of Canadians (conditional on positive use) whose prescription drug expenditure exceeds the program threshold in that year.

This substep is slightly different for the Romanow-style program than for the Kirby-style program. Under the Romanow program, the federal government pays 50% of the costs of provincial/territorial drug insurance plans above a threshold of \$1,500 per person per year; the provincial governments are then expected to expand access to prescription drugs within their own drug insurance plans by reducing their deductibles or co-payments, or by extending coverage to people who are not now included under their plans. Using this method, we can predict the number of Canadians whose prescription drug expenditure is more than \$1,500 in a given year. However, unlike under the Kirby program, not all Canadians are going to receive subsidies from the federal government. Only those people covered by provincial/territorial drug insurance plans will receive subsidies. In a given year, we cannot explicitly predict the number of Canadians whose prescription drug expenditure will be more than \$1,500 and who are also covered by a provincial/territorial drug insurance plan. In 2000, 53% of Canadians were covered by public drug plans (Fraser Group/Tristat Resources 2002). However, the majority of beneficiaries of provincial/territorial drug insurance plans are seniors and people with low incomes, who tend to have higher drug consumption. For example, while the Manitoba Pharmacare Program covered 57.9% of Manitoba's population in the year 2000/01, it covered 75.7% of Manitobans whose prescription drug expenditure exceeded \$1,500 (MCHP 2002). After implementation of the Romanow-style program, we should expect that an even higher percentage of Canadians with \$1,500+ prescription drug expenditure will be covered by provincial/territorial drug insurance plans. Therefore, for the Romanow program, we project a lower bound program cost by assuming that 75% of Canadians with \$1,500+ prescription drug expenditure are covered by provincial/territorial drug insurance plans; we project an

upper bound program cost by assuming that 100% of Canadians with \$1,500+ prescription drug expenditure are covered by provincial/territorial drug insurance plans.

Statistics Canada (2005) projects the total Canadian population in a given year for the next 50 years. Using this population projection, we can determine the number of individuals in a given year who have prescription drug expenditures higher than the program threshold. This number is the product of the population, the proportion of the population with positive prescription drug use and the proportion of Canadians with positive prescription drug use whose prescription drug expenditure exceeds the program threshold.

Projection of mean expenditure above threshold ($\bar{c}_t \mid c > \text{threshold}$)

The mean prescription drug expenditure of the group of people whose prescription drug cost exceeds the program threshold ($\bar{c}_t \mid c > \text{threshold}$) in a given year can be found from the following integral:

$$\left[\int_{\text{threshold}}^{+\infty} cf(c)dc \right] / \left[\int_{\text{threshold}}^{+\infty} f(c)dc \right]$$

where $f(c)$ is the probability density function of the log-normal distribution. It is difficult to solve this integral analytically. One common practice is to estimate this mean by a Monte Carlo simulation. After knowing the mean ($k\mu$) and standard deviation ($k\sigma$) of the prescription drug expenditure in that year, we can use a log-normal random number generator to generate a large number of observations, and then calculate the mean of those values that are higher than the program threshold.

After we have $\bar{c}_t \mid c > \text{threshold}$ and N_t , we can calculate the total program cost in that year by equation (3). To gain a better understanding of the federal government's role in total prescription drug expenditure in Canada, we will calculate the program cost to the federal government as a proportion of total prescription drug expenditure in Canada. The total prescription drug expenditure in a given year is the product of the per capita prescription drug expenditure and the population in that year. The program threshold is unlikely to stay at the same level over time. The definition of catastrophic drug expenditure is subjective. In 2000, the threshold of the Kirby program (\$5,000) is 7.7%, and the threshold of the Romanow program (\$1,500) is 2.3% of the average Canadian family total income (data source: CANSIM II, Table 2020701 and Table 3260002). We therefore include a scenario that assumes the threshold/income ratios are maintained at these levels over time. The annual rate of increase in average total family income is assumed at the historical level from 1985 to 2004: 3.8%.

The data used to calibrate our model are drawn from CIHI (2005a,b), Statistics Canada (2005), MCHP (2002) and Kirby (2002). Detailed information on the data used, their sources and description are presented in Table 2.

TABLE 2. Data used to calibrate the forecasting model

Variable	Value	Data (reference) source	Description
Per capita prescription drug expenditure in Canada, 2000	\$383.5	CIHI 2005b, data table A.3	This estimate is based on information collected by CIHI from various federal government agencies, provincial and municipal governments, private insurers and survey data.
Canadian population, 2000–2035	—	Statistics Canada 2005	The latest publication of population projections by Statistics Canada.
Percentage of Canadians who had positive prescription drug use in 2000	68%	MCHP 2002	In year 2000, 68% of Manitobans had taken at least one prescription drug. Original data source for this estimate is Health Information Services (Manitoba Health). Since the corresponding Canadian data are not available, we assume the same percentage as in Manitoba.
Total cost of the Kirby-style program in 2000	\$500 million	Kirby 2002	This estimate is provided by Fraser Group and Tristat Resources at the request of the Kirby Committee. It is based on the Fraser Group's proprietary database of private sector drug plans, the Survey of Labour Income Dynamics (SLID) and the Survey of Work Arrangement (SWA).
Number of Canadians with \$5,000+ prescription drug expenditure in 2000	100,000	Kirby 2002	This estimate is provided by the Fraser Group and Tristat Resources based on the information mentioned above.
Average annual increase in rate of per capita prescription drug expenditure in Canada, 1985–2004	8.5%	CIHI 2005a	This estimate is based on information collected by CIHI from various federal government agencies, provincial and municipal governments, private insurers and survey data.

Results

The program costs to the federal government as a proportion of total prescription drug expenditure in Canada are presented in Tables 3 and 4. The annual program costs of both the Kirby- and the Romanow-style programs will increase dramatically, even if the program threshold is raised over time. One fundamental reality is that prescription drug expenditure has increased rapidly in the past few decades, and this trend may continue in the future.

TABLE 3. Annual program costs to the federal government, constant threshold, as a proportion of total prescription drug expenditure in Canada, low-, middle- and high-growth scenarios

	Romanow-style program						Kirby-style program		
	Assumed rate of increase in annual mean prescription drug expenditure						Assumed rate of increase in annual mean prescription drug expenditure		
	6.5%		8.5%		9.5%		6.5%	8.5%	9.5%
Time	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	6.5%	8.5%	9.5%
2000	5.7%	7.6%	5.7%	7.6%	5.7%	7.6%	4.3%	4.3%	4.3%
2005	8.8%	11.8%	9.9%	13.2%	10.4%	13.9%	4.1%	5.1%	5.7%
2010	12.4%	16.5%	14.7%	19.6%	15.8%	21.1%	7.9%	11.1%	12.9%
2015	15.9%	21.2%	19.2%	25.6%	20.9%	27.8%	13.2%	19.3%	22.8%
2020	19.3%	25.8%	23.3%	31.1%	25.0%	33.3%	19.9%	29.5%	34.5%
2025	22.4%	29.9%	26.6%	35.5%	28.3%	37.7%	27.8%	40.3%	46.4%
2030	25.2%	33.7%	29.2%	39.0%	30.7%	41.0%	35.9%	50.5%	57.1%
2035	27.5%	36.7%	31.3%	41.7%	32.4%	43.3%	44.1%	59.8%	65.6%

Notes: 1) We include a high- and a low-growth scenario for both programs whereby the annual mean prescription drug expenditure in Canada increases at 9.5% and at 6.5%, respectively.

2) For the Romanow-style program, we project a lower-bound program cost by assuming that 75% of Canadians with \$1,500+ prescription drug expenditure are covered by provincial/territorial drug insurance plans; we project an upper-bound program cost by assuming that 100% of Canadians with \$1,500+ prescription drug expenditure are covered by provincial/territorial drug insurance plans.

3) For the Kirby-style program, we assume that all Canadians are covered by the proposed program.

Under both the Romanow- and the Kirby-style programs, the federal government would pick up a share of prescription drug expenditure in the future. Moreover, as Grootendorst and Veall (2005) point out, the federal government will share the open-ended upper tail of the distribution. Therefore, the allotment of prescription drug costs among the federal government, provincial governments, private drug plans and individuals will be altered significantly in the future, and a large proportion of the financial responsibility for prescription drugs will be transferred to the federal government. In 2004, the amount paid by the federal government on total prescription

drug expenditure was 2.7% (CIHI 2005a). If per capita prescription drug expenditure increases at the historical rate of the past two decades, the federal government’s share of total prescription drug expenditure under either of the two programs will increase rapidly over time. To avoid this situation, the federal government would have to raise the program threshold more rapidly than the growth of average family income, a policy that may conflict with the purpose of these programs – providing Canadians protection from catastrophic drug costs.

TABLE 4. Annual program costs to the federal government, increased program threshold, as a proportion of total prescription drug expenditure in Canada, low-, middle- and high-growth scenarios

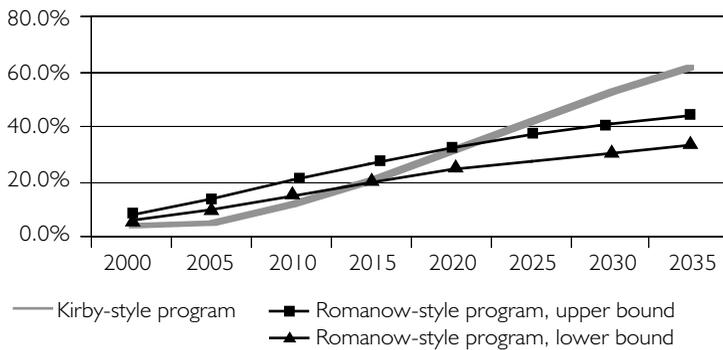
	Romanow-style program						Kirby-style program		
	Assumed rate of increase in annual mean prescription drug expenditure						Assumed rate of increase in annual mean prescription drug expenditure		
	6.5%		8.5%		9.5%				
Time	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	6.5%	8.5%	9.5%
2000	5.7%	7.6%	5.7%	7.6%	5.7%	7.6%	4.3%	4.3%	4.3%
2005	7.2%	9.6%	8.2%	10.9%	8.7%	11.6%	3.0%	3.7%	4.1%
2010	8.8%	11.8%	10.9%	14.5%	12.1%	16.1%	4.4%	6.6%	7.9%
2015	10.4%	13.9%	13.6%	18.1%	15.2%	20.3%	6.2%	10.4%	12.9%
2020	11.9%	15.9%	16.2%	21.7%	18.3%	24.4%	8.5%	15.0%	19.0%
2025	13.6%	18.2%	18.8%	25.0%	21.2%	28.2%	11.2%	20.6%	26.0%
2030	15.2%	20.3%	21.1%	28.1%	23.7%	31.6%	14.0%	26.6%	33.3%
2035	16.7%	22.3%	23.2%	31.0%	25.9%	34.5%	17.3%	32.6%	40.5%

Note: Please refer to the notes for Table 3.

The first-year costs of the Kirby-style program to the federal government are lower than those of the Romanow-style program. However, the annual program cost of the Kirby program will exceed the annual cost of the Romanow program in the long run. Figures 1 and 2 show the total annual program costs, over time, as a proportion of total prescription drug expenditure in Canada. Figure 1 uses the fixed program threshold and Figure 2 uses the more realistic assumption of increased thresholds. Although the Kirby-style program requires less initial expenditure by the federal government than does the Romanow-style program, over time the Kirby program becomes more expensive. Under the Kirby program, the federal government pays 90% of an individual’s prescription drug cost over \$5,000. Under the Romanow program, the federal government pays 50% of an individual’s prescription drug cost over \$1,500.

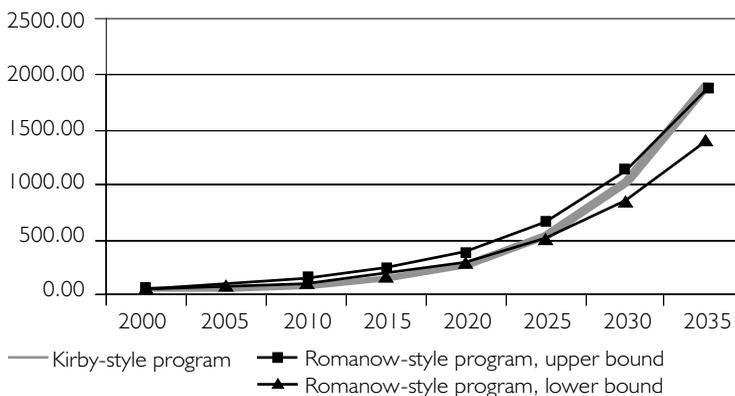
When per capita prescription drug cost is low, a high threshold leads to a lower total program cost. As per capita prescription drug cost increases over time at a rate faster than the growth in household income, the proportion of Canadians whose drug costs exceed the threshold becomes greater and thus the rate of sharing plays a more important role in the total cost of the program.

FIGURE 1. Annual total program costs to the federal government as a proportion of total prescription drug expenditure in Canada, fixed program threshold, 2000–2035



Note: An 8.5% annual rate of increase in average prescription drug expenditure in Canada is assumed.

FIGURE 2. Per capita program costs to the federal government, Kirby and Romanow programs, with increased program threshold, 2000–2035

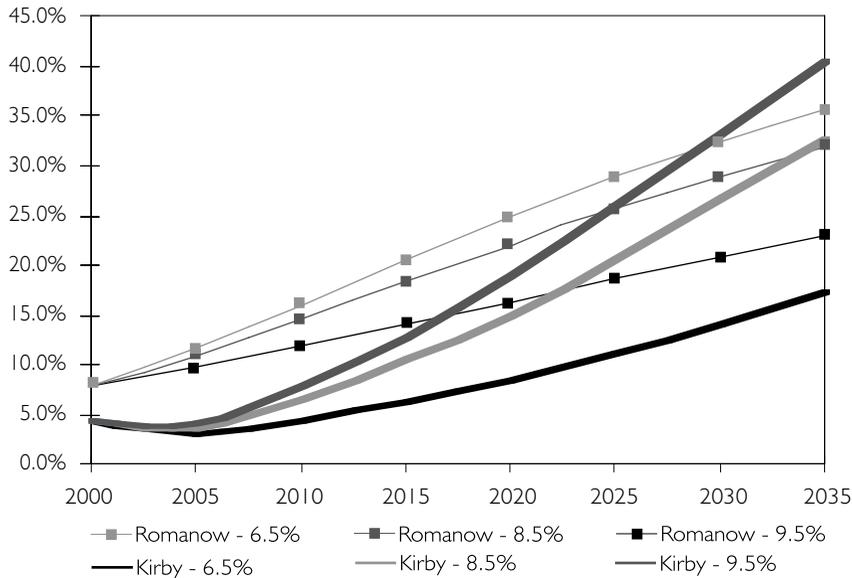


Note: An 8.5% annual rate of increase in average prescription drug expenditure in Canada is assumed.

For the same reason, the Kirby program is more sensitive to the growth rate of mean prescription drug expenditure in Canada. If the mean prescription drug expenditure increases at the average historical rate of the past two decades (8.5%) (CIHI 2005a), and the program threshold maintains its initial threshold/income ratio, in 2035 the federal share of total prescription drug expenditure in Canada under the Kirby-style program will be 32.6%. However, if the mean prescription drug expenditure increases at 6.5%, the federal share of the total prescription drug expenditure is

17.3%. The gap between these two scenarios is 15.3%, but for the Romanow-style program, this gap is only 8.7%. This pattern can be observed in Figure 3.

FIGURE 3. Program costs as a proportion of total prescription drug expenditure in Canada, different growth rates of mean prescription drug expenditure, 2000–2035



Note: Only the upper-bound costs of the Romanow-style program are presented in the above figure.

Limitations and Conclusion

In the long run, many factors may increase the costs of the proposed programs, including population growth, population aging, increasing utilization of pharmaceuticals, drug prices, incomes, behavioural responses from provincial drug plans, private drug plans and individuals (CIHI 2005a). By assuming that per capita prescription drug expenditure will grow at the average historical rate in the future, we implicitly assume that the past trends of population growth, population aging, increased pharmaceutical utilization, increased drug prices and higher incomes will also continue in the future. Assumption 2 incorporates acceleration of population aging in the cost projections.

However, the above analysis has several limitations. First, this analysis does not take into account possible behavioural responses from provincial or private drug plans and individuals. The provincial drug plans may have incentives to shift the financial burden to the federal programs, and the individuals who benefit may increase their drug utilization. The Kirby-style program may suffer more moral hazard problems from provincial/private drug plans in the long run because of the high federal cost-sharing rate. Furthermore, the new federal program may generate a crowding-out effect on private drug insurance. All these factors will increase the total cost of the

proposed program to the federal government. Secondly, in the future, population aging, introduction of costly new drugs, and the higher proportion of the population who need to spend extraordinarily large amounts on drugs may increase the skewness of the distribution. Therefore, the simulation may underestimate program costs because of the rightward skewness, especially in the early years of the cost projections. This underestimation is more serious when we assume that the program threshold is raised over time, because the group of beneficiaries is smaller compared to the case when the program threshold is fixed. Therefore, the cost projections in this analysis should be considered only as lower-bound estimates.

From the above analysis, we know that both the annual program cost and the federal government's share of total prescription drug expenditures will increase dramatically under both the Kirby- and the Romanow-style programs. Although the Kirby program requires less expenditure by the federal government than does the Romanow program in the first year, over time the Kirby program actually becomes more expensive. The underlying reason is that while the federal government will share the open-ended upper tail of the distribution under both programs, the Romanow program effectively downloads more of the prescription drug costs to other payers. A larger proportion of the increase in prescription drug expenditure would be transferred from provincial or private drug plans to the federal government under the Kirby program. For the same reason, the Kirby program is more sensitive to the growth rate of mean prescription drug expenditure.

In designing a national catastrophic drug insurance plan, one fundamental reality that cannot be ignored is the rapid increase in prescription drug expenditure. This rapid increase will have a far-reaching influence on long-run program costs. The cost implications to the federal government of the program threshold and federal cost-sharing rate will change over time. As the per capita prescription drug cost increases, the sharing rate, rather than the program threshold, will play a more important role in total program costs to the federal government.

Although a national catastrophic drug insurance plan will incur great public expenditure, the total costs to the healthcare system as a whole may not increase so much. Soumerai et al. (1991, 1994) show that restrictions on drug use in the US Medicaid program have led to cost increases for other healthcare services. In the Canadian context, Tamblyn et al. (2001) show that the imposition in Quebec of cost-sharing for drugs decreased the use of essential drugs among the elderly and among welfare recipients, resulting in significant increases in hospitalizations, nursing home admissions, deaths and emergency department visits. Although these authors do not present cost data, the increase in serious adverse events seems likely to have raised total costs. Under a national catastrophic drug insurance plan, improved morbidity and mortality in the population may reduce the costs elsewhere in the healthcare system. One useful direction for future research may therefore be to explore the link

between prescription drug expenditure and other healthcare expenditures.

Options for a national catastrophic drug insurance plan represent different ways of realigning prescription drug expenditures in Canada among the federal government, provincial and private plans, and individual payers. The above analysis shows that if a single payer assumes most of the financial responsibility, it will face escalated pressure over time, possibly threatening the program's sustainability. Moreover, the program threshold and cost-sharing rates are crucial to the future costs incurred by the payers. In conclusion, in order to maintain long-term program sustainability, future analyses should pay close attention to plan design and the role of engaged stakeholders.

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Appendix 1: A Case Study to Support Assumptions 1 and 4

The group means of the top 5%, 10%, 15% and 20% of users of the Ontario Drug Benefit (ODB) program in 2004/05 can be found in the *2004/05 Report Card for the Ontario Drug Benefit Program* (Ontario Ministry of Health and Long-Term Care 2005). In this Appendix, we use the method described under Method to project those group means based on the 2000/01 ODB data. If Assumptions 1 and 4 hold true, the projected numbers for 2004/05 should be very close to the actual numbers.

The ODB program is not a population insurance program in that it selectively targets persons with very high-cost drugs, and thus the upper 5%, 10%, 15% and 20% of costs for this group would not be typical of the entire population. However, we can assume that both the expenditure distribution for the ODB beneficiaries and for the entire population are log-normal, although they have different means and variances. Our method can be applied to any log-normal distributions. We use the ODB data to verify the two assumptions, since ODB provides detailed information on cost distributions.

We find that the two sets of numbers are very close. The comparison is presented in Table A1.

The simulated numbers are slightly lower than the true value. A possible reason is that for the given mean and standard deviation, the simulation does not generate sufficient outliers. The impact of those missing outliers on the group mean in the simulation is significant when the group size is small. An alternative interpretation is that the variance of the distribution increases faster than the assumption that the standard error rises in lock-step with the mean allows. This is one limitation of this projection method, and it may lead to downward bias of the projection. As the group size becomes larger, the influence of the outliers will become less significant; therefore, the simulated group means will become closer to the true values. This pattern can be observed in Table A1. The result demonstrates that the reliability of the simulation increases as the group size increases.

TABLE A1. Simulated group means and the real group means from ODB data

	Group mean		
	ODB data, 2004/05	Simulation	Difference
Top 5%	\$8,446	\$7,850	\$596
Top 10%	\$6,194	\$5,933	\$261
Top 15%	\$5,162	\$4,958	\$204
Top 20%	\$4,491	\$4,327	\$164

Note: The simulation is based on the method described in the Method section of the paper.

Appendix 2: Technical Details of the Projection Method

In this Appendix, we use the Kirby-style program to illustrate the method of projecting the proportion of Canadians whose prescription drug expenditure exceeds the threshold in a given year. As reported in Table 2, we have the following initial conditions in year 2000:

- $C_{2000} = \$500$ million.
- $N_{2000} = 100,000$ (number of individuals with prescription drug costs over the program threshold (\$5,000), or 0.47% of the subpopulation that have positive drug use. In other words, 99.53% of Canadians with positive drug use had prescription drug expenditures of less than \$5,000 in 2000.
- Therefore, from equation (2), we arrive at $\bar{c}_{2000} = \$10,556$.
- Mean prescription drug expenditure in Canada in 2000 is \$383.35 (CIHI 2005a).
- Sixty-eight per cent of Canadians had positive prescription drug use in 2000; therefore, the mean prescription drug expenditure for those Canadians is \$563.75.

With these initial conditions, we could estimate the mean (μ) and variance (σ) of the log-normal distribution in 2000 by using the following two general results:

$$E(\text{esp}(z)) = e^{(\mu + \sigma^2 / 2)} \quad (4)$$

$$\text{prob}(-\infty < \frac{\ln 5000 - \mu}{\sigma} < Q) = 0.9953 \quad (5)$$

Equation (4) is the first moment of a log-normal distribution, where $E(\text{esp}(z))$ equals \$563.75 in 2000. Equation (5) is from standardization of the following equation:

$$\text{prob}(-\infty < z < Q) = 0.9953 \quad (6)$$

Equations (5) and (6) mean that 99.53% of Canadians with positive drug use had prescription drug expenditures of less than \$5,000 in 2000. From a standard normal distribution table, we can find the value of Q corresponding to 0.9953. With equations (4) and (5), we have two equations and two unknown variables, and we can then solve for μ and σ in 2000. For the given data, we have

$$563.75 = e^{(\mu + \sigma^2 / 2)} \quad (7)$$

Taking log on both sides, we get

$$\ln(563.75) = \mu + \sigma^2 / 2 \quad (8)$$

According to equation (5) and the value of Q corresponding to 0.9953 (the proportion with prescription drug expenditure less than \$5,000), from a standard normal distribution table, we have

$$\frac{\ln 5000 - \mu}{\sigma} = 2.594 \quad (9)$$

With equations (8) and (9), we have two equations and two unknown variables, and then we can solve for μ and σ in 2000:

$$\mu = 5.776, \sigma = 1.057 \quad (10)$$

In a given year t in the future, with Assumption 3, we have the following condition:

$$E(\exp(z')) = e^{(k\mu + k^2\sigma^2 / 2)} \quad (11)$$

From Assumption 2, we know the mean prescription drug expenditure $E(\exp(z'))$ in that year, enabling us to estimate the only unknown variable k in equation (11). With this k , we can calculate Q :

$$\frac{\ln 5000 - k^*\mu}{k^*\sigma} = Q \quad (12)$$

From this Q , with a standard normal distribution table, we can calculate x :

$$\text{prob}(0 < \frac{\ln 5000 - k^*\mu}{k^*\sigma} < Q) = x \quad (13)$$

The percentage with more than \$5,000 prescription drug expenditure in that year is $1 - x$. For example, in the year 2005, the mean prescription drug expenditure conditional on positive prescription drug use is \$847.69 (8.5% annual growth rate). According to equation (11), we have

$$847.69 = e^{(k\mu + k^2\sigma^2 / 2)} \quad (14)$$

Taking log on both sides, we get

$$\ln(847.69) = k\mu + k^2\sigma^2 / 2 \quad (15)$$

Substituting (10) into (15), we can solve for k :

$$k = 1.059 \quad (16)$$

According to equation (12), with the k , μ and σ in (10) and (16), we can calculate the critical value Q :

$$\frac{\ln 5000 - 1.059 * 5.776}{1.059 * 1.057} = Q = 2.146 \quad (17)$$

With this Q , from the standard normal distribution table, we can determine x :

$$x = 0.984 \quad (18)$$

Therefore, in 2005, $1 - x = 0.016$, so 1.6% of Canadians with positive prescription drug use would have had more than \$5,000 prescription drug expenditure. Similarly, we can calculate this proportion in the other years.

RESEARCH PAPER

Adapting the Balanced Scorecard for Mental Health and Addictions: An Inpatient Example

Adapter le tableau de bord prospectif aux services
de santé mentale et de toxicomanie : l'exemple des
patients hospitalisés



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Abstract

The Balanced Scorecard (BSC) is a performance-monitoring framework that originated in the business sector but has more recently been applied to health services. The province of Ontario is using the BSC approach to monitor quality of inpatient care in five service areas. Feasibility of the scorecard framework for each area has been assessed using a standard approach. This paper reports results of the feasibility study for the mental health sector, focusing on three issues: framework relevance, underlying strategic goals and indicator selection. Based on a literature review and extensive stakeholder input, the BSC quadrant structure was recommended with some modifications, and indicators were selected that aligned with provincial mental health reform policy goals. The mental health report has completed two cycles of reporting, and has received good support from the field.

Résumé

Le tableau de bord prospectif (TBP) est un cadre de suivi du rendement qui provient du secteur des affaires et qui a été récemment adopté dans les services de santé. L'Ontario utilise les TBP pour surveiller la qualité des services aux patients hospitalisés pour cinq types de services. La faisabilité du cadre de travail des TBP a été évaluée pour chaque service au moyen d'une approche normalisée. L'article fait état des résultats de l'étude de faisabilité pour le secteur de la santé mentale, touchant trois enjeux : la pertinence du cadre de travail, les objectifs stratégiques sous-jacents et le choix des indicateurs. À la suite d'une revue de la littérature et de nombreuses informations recueillies auprès des parties prenantes, la structure à quadrants des TBP a été recommandée avec quelques modifications et des indicateurs ont été choisis en correspondance aux objectifs de réforme politique de la province en matière de santé mentale. Le rapport sur la santé mentale a franchi deux étapes de son cycle et a reçu un appui favorable de la part du secteur concerné.

THE BALANCED SCORECARD (BSC) IS AN APPROACH INCREASINGLY USED to monitor performance of healthcare systems. Introduced and developed by Kaplan and Norton (1992, 1996) for the business sector, its central premises are that a company should be evaluated on its progress towards its strategic objectives using both traditional financial measures and measures in three other areas: customer perspective, internal business processes and organizational learning and growth. Indicators should measure organization performance for key strategic objectives in all four areas and should be composed of component parts that reflect specific company practices. The BSC thus provides both a comprehensive picture of a busi-

ness's progress and a guide for targeting interventions. Its advantages have been widely described (Kaplan and Norton 1992, 1996; Meyer 2002).

Baker and Pink (1995) proposed a strategy for adapting the BSC to healthcare organizations (also see Pink et al. 2001; Zelman et al. 2003), and many examples of its use have been reported (Wolfersteig and Dunham 1998; Griffith et al. 2002; ten Asbroek et al. 2004; Auger and Roy 2004; Yang and Tung 2006; Inamdar et al. 2002). However, mental health and addictions have lagged behind other health sectors in adopting the BSC, as evidenced by few published case examples (Coop 2006; Santiago 1999; Schmidt et al. 2006).

An opportunity to use the BSC for monitoring mental health and addictions inpatient services in Ontario, Canada emerged in the late 1990s as part of a larger initiative to develop inpatient scorecards for acute, emergency, rehabilitation and complex continuing care (HRRC 2007). All these report cards were based on the BSC framework. A decision was made to add mental health and addictions inpatient care to the suite, pending a feasibility study. This paper describes the process and results of that study, focusing on three issues: assessment of framework relevance, strategic goal selection and indicator selection.

Study Background

The Hospital Report Research Collaborative (HRRC) was a partnership between academic centres, hospital stakeholders and the Ontario Ministry of Health and Long-Term Care, formed in 1997 to develop relevant and scientifically valid report cards for monitoring the quality of inpatient care. The HRRC (2007) focused first on acute care and expanded quickly to other health sectors. Its reports were based on the BSC framework for healthcare organizations proposed by Baker and Pink (1995), who re-conceptualized the four quadrants as clinical utilization and outcome, system integration and change (the equivalent to Kaplan and Norton's innovation and learning quadrant), patient satisfaction and financial performance and condition. Report card development for all sectors followed the same sequence of determining feasibility, recommending indicators and then reporting indicators at the regional level before shifting to individual organization reporting.

A study was funded to develop a mental health hospital report following these three steps. The team formed a multi-stakeholder advisory panel to provide consultation and advice throughout the study. Additionally, the team attended HRRC meetings to maintain as much consistency as possible with the definitions and methods used in the other sectors. In developing its report, the study team encountered three significant problems that required resolution. The first was that the four quadrants described by Baker and Pink (1995) did not match commonly used categories in mental health monitoring. The second was the need to identify the strategic objectives that

could be measured by the report card. The third was to select indicators that, based on strategic objectives, were meaningful, valid and feasible. This paper reviews each issue, first describing the method used and then reporting the decisions. A final section briefly summarizes the resulting framework and indicators.

Framework Relevance

A major challenge in applying the BSC to mental health and addictions care is the already long-standing tradition of performance measurement in mental health. One of the oldest and best-known US examples is the Mental Health Statistical Improvement Program (MHSIP) developed by the National Institute of Mental Health (Leginski 1989). The MHSIP began with a focus on the information needed to manage and deliver high-quality mental healthcare in adult community services but has expanded to include children, youth and inpatient services (MHSIP 2007). Data sources were initially administrative but eventually included a consumer survey (MHSIP Task Force 1996). Indicators assessed performance in five areas: access, appropriateness/quality, outcomes, participation and continuity. The MHSIP has continued to evolve through developing and piloting mental health service indicators (Lutterman et al. 2003) and producing mental health quality reports (Ganju 2006; Smith and Ganju 2006).

The distinct approaches represented by the MHSIP and the BSC posed a dilemma when choosing or developing an approach for mental health performance monitoring. Toolkits and frameworks such as the MHSIP provide a common language and are generally accepted within the mental health community, whereas the BSC, because of its business management origins, is relatively foreign and thus risks poor credibility with mental healthcare providers (Coop 2006). However, because of its growing application to healthcare monitoring, especially in Ontario, adoption of the BSC provided an opportunity for mental health and addictions to share a common language with other healthcare measurement strategies.

The study team reviewed mental health monitoring frameworks to assess for similarities to the BSC. A snowball sampling method was used. A list of key performance initiatives (such as the MHSIP) was created through a literature review and suggestions from international experts. Follow-up on this list led to identification of other candidates. Search criteria included

- focus on mental health and addictions sectors;
- development and refinement using wide stakeholder participation;
- coverage of a range of service and system functions consistent with those available in Ontario, and an underlying health system similar to that of Ontario;

- detailed descriptions for framework, including a rationale and discussion of limitations; and
- inclusion of at least one completed cycle of implementation.

Nine frameworks met most or all of the criteria (Table 1). Of these, two were not specific to mental health but were included because of their Canadian relevance. A third was at the conceptual stage only, but was included because it was comprehensive and well known nationally. Print and Web-based documents for each framework were reviewed, with any needed clarification sought by telephone. Follow-up interviews also sought feedback on developmental and implementation challenges, especially related to use of data for decision-making. The major conceptual areas or domains from each framework were recorded, along with the rationale for their inclusion and any recommended or calculated indicators.

Table 1 shows the domains assessed in each of the nine initiatives. The most striking feature is the high degree of consistency, with the majority of frameworks sharing more than half the domains. The second is the limited correspondence between these domains and the BSC quadrants. This lack of an easy equivalence led to the development of a matrix (Table 2) representing the BSC quadrants and five mental health domains. Domains were selected based on their near-universality across the reviewed frameworks (Accessibility, Appropriateness and Outcomes) or their particular relevance to Ontario healthcare policy (Participation and System Management).

Selection of Strategic Objectives

The project mandate was to develop a BSC for individual hospital use. However, there are 56 Ontario hospitals that provide psychiatric care in designated mental health beds and that were the targeted users for the report. Representing the strategic goals of all 56 in a single BSC was not feasible. Fortunately, the province, like many other jurisdictions, has developed a series of policy documents spanning nearly two decades that outline the goals of mental health reform and the roles that different sectors are expected to play (OMH 1988, 1993, 1999). These policies elaborate different aspects of a consistent vision in which the central goals mark a shift from treating symptoms to treating the whole person, from institutional to community-based care and from “silos” of care to integrated and seamless services.

Given Ontario’s universal and largely single-payer healthcare system, it seemed appropriate to treat these policies as the mental healthcare system’s strategic plan that should strongly influence the practices of its constituent providers and organizations. This decision was supported by senior hospital administrators on the advisory panel, who felt that a provincial-level report card would be a useful complement to individual

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hospital monitoring efforts. The decision to apply the strategic plan of a larger system to smaller operational units differs from the approach taken in the United Kingdom (Schmidt et al. 2006) and New Zealand (Coop 2006), where the scorecard was driven by the system's own strategy rather than that of a larger entity in which the system was embedded. A strength of our approach is that it creates a multi-level framework that allows the common goals of units (e.g., hospitals) and their larger environment to be considered in tandem with those goals that are unit-specific (Lin et al. 2002).

TABLE 1. Common domains measured in nine mental health/addictions frameworks

Domains	ANMH	BASIS-32 Plus	BC	CCHSA	CIHI	MHSIP	PERMES	VA	WPIC
Accessibility/ Responsiveness	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptability	✓				✓				
Appropriateness	✓	✓	✓	✓	✓	✓	✓	✓	✓
Competence	✓			✓	✓				
Outcomes/ Effectiveness	✓	✓	✓	✓	✓	✓	✓	✓	
Coordination/ Continuity	✓	✓		✓	✓	✓		✓	✓
Financial/Efficiency	✓			✓	✓		✓	✓	✓
Participation		✓	✓	✓		✓			
System management			✓						

Source: Lin et al. 2002.

ANMH – performance monitoring research kit, Federal/Provincial/Territorial Advisory Network on Mental Health (McEwan and Goldner 2001); BASIS-32 Plus (Eisen et al. 1999); BC – British Columbia Performance Monitoring System (Provincial Performance Monitoring Reference Group 2000); CCHSA – mental health initiative, Canadian Council on Health Services Accreditation 2001; CIHI – mental health initiative, Canadian Institute for Health Information 2001; MHSIP – consumer-oriented mental health report card (MHSIP Task Force 1996); PERMES – Georgia Performance Measurement and Evaluation System (Center for Mental Health Policy and Services Research 2001); VA – Veteran's Administration National Mental Health Program Performance Monitoring System (Rosenheck and DiLella 2000); WPIC – clinical pathway algorithm set from Western Psychiatric Institute and Clinic (Ghinassi 2000).

A review of Ontario's mental health reform policies (OMH 1999) yielded four objectives specifically relevant to inpatient care:

1. targeted and appropriate use of inpatient services, that is, care delivered in the least restrictive setting, based on need;

2. a comprehensive continuum of services and supports that are linked and coordinated, allowing individuals to move easily from one part of the system to another;
3. services based on current evidence about best practices; and
4. consumer-centred care, that is, tailored to the needs and preferences of the individual to support an improved quality of life.

TABLE 2. Matrix of BSC quadrants and mental health domains

MENTAL HEALTH DOMAIN	BSC QUADRANT			
	System integration and change	Clinical utilization and outcomes	Patient perception of care	Financial performance and condition
Accessibility				
Appropriateness				
Outcomes				
Participation				
System management				

Source: Lin et al. 2002.

Indicator Selection

The framework and four strategic goals provided one set of guidelines for indicator selection. Other criteria commonly used to assess performance indicators include scientific soundness, meaningfulness or relevance, feasibility and actionability (Rosenheck and Cicchetti 1998; Hermann and Palmer 2002; Hermann et al. 2004; Larson and Mercer 2004). This project gave particular emphasis to feasibility and relevance because of feedback from other jurisdictions that lack of data and user buy-in limited what could actually be reported or used. Potential indicators were selected using the following criteria:

- Did the measure reflect one of the four provincial strategic objectives?
- Could it be calculated (or was it already being calculated) from available data?
- Did it have a clearly desirable direction or pattern that identified better performance?
- Was it actionable?
- Were the BSC quadrants and mental health domains represented in the final indicator set?
- Was the final indicator set manageable (e.g., relatively short, understandable)?

These criteria were applied in a three-part, iterative process to select indicators. First, the project team evaluated the measures used in the reviewed frameworks against the four strategic objectives and available data in provincewide sources such as health insurance claims and hospital discharge abstracts. Indicators not measured by existing provincial data were retained and bookmarked if a suitable data source was expected soon.

Next, the project advisory panel reviewed both existing and bookmarked indicators on the criteria of meaningfulness vis-à-vis provincial strategy, whether there was a desired value or direction and hospital control over results. Consultation with the panel continued as data became available, this time shifting the evaluation from the theoretical to the actual numbers. At this point, data quality was also considered, as was performance variation across hospitals. Fortunately, the advisory panel – composed of policy makers, planners, hospital administrators and senior management, providers and consumers – has remained largely intact throughout the project (Lin et al. 2002, 2005).

The third step involved end-user feedback. Hospitals were surveyed after they received their individual draft results and site visits were conducted to elicit feedback and suggestions for improvement. These processes were particularly critical because the use of provincial strategic directions to guide indicator selection created the risk that hospitals would find the results irrelevant or not actionable. Because hospitals were the intended end users (Brown et al. 2004), an important ingredient in the successful adaptation of the BSC was user acceptance.

Table 3 reports survey results. Hospitals rated each indicator on its relevance to their own strategic goals, whether they were already calculating and using it and the extent to which they had control over the indicator's value. Of the 56 canvassed hospitals, 41 (73%) responded. Overall, there was solid endorsement of the relevance of the indicators ("very relevant" judgments averaged 69% across all indicators and ranged between 39% and 91%). There was a similar finding for the numbers of hospitals calculating these or similar indicators at least yearly (average 66%, range 20%–96%), but there was also a drop-off in the proportion judging that the indicators were completely (average 38%, range 10%–74%) or somewhat (average 54%, range 26%–75%) under their control. These results influenced subsequent indicator refinement. However, their primary value may be the accompanying discussions about local factors that might affect hospital performance, processes or structures that might be changed and the hospital and governing bodies that should be at the accountability and quality improvement tables.

Resulting Framework and Indicators

The result of the feasibility study has been an endorsement of the BSC framework for mental health inpatient reporting in Ontario. A report structure and indicators were

proposed, and two cycles of reporting (first provincial results only, then hospital-level reporting) have since occurred. The most recent report includes 29 indicators. These are shown in Table 4, organized by the quadrant/domain matrix and labelled with the strategic objective that they reflect. Table 4 represents the current state of a process that began with 40 recommended indicators (Lin et al. 2002); these were reduced to 31 three years later (Lin et al. 2005) and were subsequently decreased again. Reasons for removing indicators include very small numbers and hence little variation (e.g., rate of formal complaints), unreliable measures (e.g., percentage of emergency room discharges admitted to “no available inpatient bed”) and no clearly desirable direction or pattern in terms of quality of care (e.g., average length of stay). The expectation is that the process of indicator selection and refinement will continue as new data sources become available, strategic objectives are accomplished or provincial directions change.

TABLE 3. Hospital evaluations of inpatient mental health and addictions BSC indicators

Strategic objectives and related indicators	Relevant to your hospital's strategic goals?	Already calculate this or very similar indicator?	Hospital can influence performance on this indicator?	
	% Very relevant	% At least yearly	% Completely	% Somewhat
Targeted and appropriate use of inpatient services				
Hospitalization for psychotic diagnoses	63	76	10	68
Alternative level of care days	91	92	33	61
Integration and post-discharge care				
Inter-organizational networking	84	75	53	48
Notification of hospitalization	72	42	61	34
MD care within 30 days post-discharge	57	31	13	66
Emergency department visit within 30 days post-discharge	76	53	21	72
30-day readmission rate	87	80	20	75
Repeat inpatients*	73	59	19	75
Evidence-based practice				
Use of guideline care for tracer conditions	39	20	36	50
Staff ratings of outcome	70	54	58	39
Client ratings of outcome	81	67	47	53

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TABLE 3. Continued

Consumer-centred care				
Discharge plans completed with client involvement	84	56	74	26
Advisory committees with consumer/family representation	87	68	74	26
Discharged against medical advice	71	67	23	74
Other indicators				
Number of ontarians hospitalized (by age, sex and region)*	43	54	24	41
Patient care hours**	72	85	31	63
Nursing worked hours*** as a % of nursing total hours	79	85	42	58
Nursing purchased service hours**** as a % of nursing worked hours	60	62	43	40
Management and operational support hours as a % of total hours	78	75	47	47
Registered nurse hours as a % of nursing total hours	73	82	47	53
Full-time registered nurse hours as a % of total registered nurse hours	74	96	36	64
Nursing worked hours as a % of inpatient care worked hours	68	77	34	63

* Relevant only at the regional or provincial level.

** Applicable only to free-standing psychiatric hospitals.

*** Nursing hours spent in providing patient care.

**** Nursing hours worked that were purchased from an agency.

TABLE 4. Inpatient performance indicators by quadrant/domain matrix and provincial strategic objective

Mental Health Domain	BSC Quadrant			
	System integration and change	Clinical utilization and outcomes	Patient perception of care	Financial performance and condition
Accessibility		% Population hospitalized (by age, sex, region)	4: Perceptions of accessibility	
Appropriateness	1: % hospitalized for psychotic diagnoses 3: Use of guideline care for tracer conditions	2: MD Care within 30 Days Post-Discharge 2: Emergency Department Visit within 30 Days Post-Discharge (but not admitted) 2: Summary Indicator: 30-Day Post-Discharge Care (all sectors)	4: Discharged against medical advice 4: Perceptions of appropriateness	

TABLE 4. Continued

Outcomes		2: 30-day readmission rate 2: Repeat inpatients 3: Staff ratings of outcome 3: Client ratings of outcome	4: User satisfaction with treatment outcomes	
Participation	4: % Discharge plans completed with client involvement 4: % Hospital or program advisory/steering committees with consumer representation		4: Perceptions of inclusion in treatment decisions	
System management	1: % Lengths of stay \leq 3 days 1: % Alternative level of care days 2: Inter-organizational networking 2: Notification of hospitalization	2: % Discharge plans completed with community provider involvement		*Patient care hours *Nursing worked hours as a % of nursing total hours *Nursing purchased service hours as a % of nursing worked hours *Management & operational support hours as a % of total hours *Registered nurse hours as a % of nursing total hours *Full-time registered nurse hours as a % of total registered nurse hours *Nursing worked hours as a % of inpatient care worked hours

KEY: 1: = Strategic Objective: targeted and appropriate use of inpatient services
 2: = Strategic Objective: integration and post-discharge care
 3: = Strategic Objective: evidence-based practice
 4: = Strategic Objective: consumer-centred care
 * = No immediate strategic objective.

Discussion and Conclusions

Zelman et al. (2003: 12) point out the necessity of modifying the BSC to fit “industry and organizational realities.” Our project found three critical points where adaptation was required. Like other implementations of the BSC in healthcare, we encountered

concepts that did not map easily onto the BSC. Solutions reported in the literature have included modifying the scope of the original quadrants (Baker and Pink 1995), adding new quadrants (e.g., Santiago 1999) or changing the expected sequence or causal relationship among them (Rimar 2000). Because of our interest in maintaining consistency with the other HRRC report cards, yet remaining on familiar conceptual territory with mental healthcare providers, we created a matrix that would accommodate both BSC and mental health and addictions perspectives rather than force-fit one onto the other.

Our second critical point was deciding which strategic goals should drive indicator selection. Zelman et al. (2003) distinguish between scorecards for healthcare organizations and for healthcare sectors. In both cases, the strategy of the relevant unit of analysis (i.e., the organization or the sector) drives indicator selection. However, the organizational-level scorecard is internally applied using specific indicators and a focus on quality improvement. The healthcare sector scorecard is externally applied using general system indicators with a focus on public accountability. Our use of provincial policy as a systemwide “strategic plan” is similar to the latter, with an important difference. The role of inpatient care as one point on the care continuum implies a strong concordance between system-level and hospital-level strategic objectives. It also implies that hospital performance is at least partially contingent on strong and coordinated performances by other sectors. These implications are consistent with the hospital evaluations of the relevance of our chosen indicators to their own strategic goals as well as their perceived degree of control over the indicator values. Under these circumstances, the distinction between internal and external is not always straightforward, and perhaps some concept of shared quality improvement or mutual accountability may be appropriate.

The third critical point was selecting the indicators. Our iterative use of information from existing frameworks, available data and feedback from our advisory panel and the end users allowed us to apply multiple criteria in a more complex way than using a serial set of filters. This process has also resulted in an ongoing relationship with Ontario hospitals that should assist in future performance monitoring using the BSC.

There is still insufficient information from the field to allow us to judge which of our modifications may be useful to healthcare in general, which are specific to mental health and addictions and which are even more specific to Ontario. Other reports indicate that the divide between managerial and provider perspectives pervades many healthcare sectors (Schiff 2000; Horwitz 2005) and that the choice of what should be monitored and how are ubiquitous challenges (Campbell et al. 2003; Hermann and Palmer 2002). As more monitoring initiatives are reported, a broader range of potential solutions will become available. The variations in their purpose, strengths and limitations will be useful information for those developing and implementing new performance monitoring systems.

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Evaluation of Booking Systems for Elective Surgery Using Simulation Experiments

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Appendix: The Simulation Model

Simulation approach

We applied Statecharts formalism to describe the progress of individual patients through surgical care as a series of asynchronous updates in patient records generated in reaction to events produced by parallel finite state machines representing concurrent clinical and managerial activities (Gruer et al. 1998). The specifications of peri-operative activities were based on the process of cardiac surgical care at a tertiary care hospital in British Columbia, Canada (Vasilakis et al. 2007). We used the Statecharts language to define detailed functional and behavioural specifications of states and transitions within each activity of care delivery (Sobolev et al. 2008). This approach allowed us to include realistic features of scheduling consultations and booking admissions, which made the simulation results applicable to other surgical services. For example, using Statecharts notions of parallelism and event broadcasting, we represented the availability of surgeons for consultations, scheduled operations and on-call duties by developing one statechart for describing the rotation of duties and vacation schedules and another for describing the allocation of clinic and operating room slots to surgeons according to their weekly availability.

Underlying assumptions

In constructing the simulation model, we made the following simplifying assumptions.

- For each simulation week, the random numbers of referrals for consultations and the random numbers of emergency patients and inpatients were drawn from Poisson distributions to allow for fluctuations in demand.
- Referrals can have high or low priority for surgical consultation. Those with high priority are scheduled before those with low priority; referrals with the same priority are scheduled by referral time.
- Sixteen consultation appointments are available each week, and all patients attend their appointments.
- Seven operating room slots for elective surgery and eight for urgent procedures are available each week. Two methods for allocation of operating room slots over weekdays were studied: weekly and daily, split between elective and urgent procedures.

- In pre-booking, elective cases with high and medium priority are eligible for scheduling in both elective and urgent slots, and those with low priority are scheduled only in elective slots available to the consulting surgeon.
- In wait list booking, elective cases with any priority may be scheduled in any urgent slots available to the consulting surgeon, so long as there are no inpatients waiting in hospital.
- Emergency and urgent inpatients are placed on a current operating room schedule immediately. They are scheduled in urgent slots, if such are available; otherwise, previously scheduled operations may be cancelled to accommodate these cases.
- Inpatients whose need for surgery is less urgent are placed on the current schedule if there are available urgent slots; otherwise, they are scheduled in urgent slots available the next week.
- When scheduled operations are cancelled, patients with high or medium priority for elective surgery become inpatients, and those with low priority join the promise-to-readmit queue.
- The surgeons' service and vacation schedules are planned according to an 18-week cycle; the booking horizon is 36 weeks.
- Clinical decision-making that determines the progress of patients needing elective surgery from consultation priority groups to surgical priority groups was governed by binomial (branching) probabilities, as was the progress of patients needing urgent surgery from expedited consultation to surgery (as either inpatients or outpatients).

Table A1 shows the values of the model parameters that were used in all simulation runs, including the number of priority groups, arrival rates, branching probabilities and capacities. Complete model documentation, including the Statecharts specifications, is available from the authors.

TABLE A1. Simulation parameters

Parameter	Values
Priority groups	
Outpatient consultation	high, low
Operation	high, medium, low
Referral rate (patients per week)	
High priority for consultation	0.5
Low priority for consultation	6.5

Evaluation of Booking Systems for Elective Surgery Using Simulation Experiments

TABLE A1. Continued

Inpatients	5.8
Emergency	0.5
Probabilities of progression	
Elective patients	
High consultation priority to high surgical priority	1
Low consultation priority to medium surgical priority	0.76
Low consultation priority to low surgical priority	0.24
Inpatients	
Inpatient assessment	0.5
Discharge and outpatient assessment	0.5
Capacity	
Number of surgeons	3
Weekly number of outpatient consultations	16 (8 on Monday, 8 on Tuesday)
Weekly number of elective slots	7
Weekly number of urgent slots	8

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