

HEALTHCARE

# POLICY

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## Politiques de Santé

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

**Volume 6 ♦ Number 3**

**Engine or Boat Anchor? The Health Professional Training  
Establishment in HHR Innovation**

JOHN H.V. GILBERT

**Getting the Foundations Right:  
Alberta's Approach to Healthcare Reform**

STEPHEN DUCKETT

**Access to Cancer Drugs in Canada:  
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**Geographic Accessibility of Community Pharmacies in Ontario**

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**Availability of Healthcare Resources, Positive Ratings of the Care  
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*Data Matters ♦ Discussion and Debate ♦ Research Papers  
Knowledge Translation, Linkage and Exchange*

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*Health Services, Management and Policy Research*  
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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.

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*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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ANNE SALES, HANNAH M. O'ROURKE, KELLIE DRAPER, GARY F. TEARE AND  
COLLEEN MAXWELL


*This Alberta study brought together providers of continuing care and decision-makers to prioritize quality indicators in long-term care and home care. The process demonstrates how providers and policy makers can work together to assess priorities for quality improvement.*

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DORIS M. HOWELL, TOM ABERNATHY, RHONDA COCKERILL, KEVIN BRAZIL,  
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*The study team analyzed linked data to determine predictors (predisposing, enabling and need factors) for home care use and home death in a Toronto pilot program providing equal access to palliative home care services. Only 25% of the study population (n=418) required acute hospital care at the end of life, compared to 55% of cancer deaths in the same metropolitan area.*

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EXTREMITY RESEARCH GROUP

*The authors examined physiotherapy claims related to musculoskeletal disorders in Ontario. While the unionized workplace in the study provided on-site therapy, the user-pay approach to outpatient PT is increasing, raising the question of unequal access for those employees not privately insured or not in unionized workplaces.*



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*Un sondage effectué auprès de gestionnaires de programmes d'assurance médicaments provinciaux pour connaître les coûts de dépense les plus élevés quant aux médicaments pour traiter le cancer démontre l'existence d'une variation interprovinciale dans l'accès aux médicaments financés par les fonds publics, et ce, même après que ces médicaments aient été approuvés dans le cadre d'une couverture publique.*

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- 36  **Accessibilité géographique aux pharmacies communautaires en Ontario**  
MICHAEL R. LAW, ANNA DIJKSTRA, JAY A. DOUILLARD ET STEVEN G. MORGAN  
*L'analyse du lieu géographique des pharmacies en fonction des prévisions tirées du recensement démographique démontre que les pharmacies demeurent accessibles pour la majorité de la population en Ontario. Il semble que les quelques fermetures dues aux changements de prix pour les médicaments génériques auraient peu d'impact sur l'accès géographique, mais pourraient affecter les coûts, les temps d'attente ainsi que les choix offerts aux patients.*
- 46  **Disponibilité des ressources de soins de santé, appréciation positive de l'expérience de soins et étendue de l'utilisation des services : une relation inattendue**  
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*Au Québec, l'appréciation de l'expérience des soins et l'utilisation des services sont étonnement plus élevées là où la disponibilité des ressources est limitée ou dans la moyenne. Le simple fait d'injecter des ressources pour améliorer la capacité du système peut conduire au risque de diminuer l'appréciation de l'expérience de l'utilisateur, au lieu de l'améliorer.*
- 55  **Prioriser l'information pour l'amélioration de la qualité au moyen des données provenant d'un système d'information sur les services à domicile : expérience d'une province canadienne**  
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*Cette étude albertaine a réuni les fournisseurs de soins prolongés et les décideurs afin de classer les indicateurs de la qualité pour les soins à domicile et dans les établissements de soins de longue durée. Ce processus a permis de démontrer comment les fournisseurs et les responsables de politiques peuvent travailler ensemble à l'évaluation des priorités visant l'amélioration de la qualité.*

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- e73  **Facteurs de prévision des dépenses pour les soins à domicile et les décès à domicile chez les patients atteints du cancer dans le cadre d'un programme pilote de soins palliatifs complets à domicile**  
DORIS M. HOWELL, TOM ABERNATHY, RHONDA COCKERILL, KEVIN BRAZIL, FRANK WAGNER ET LARRY LIBRACH  
*L'équipe de cette étude a analysé des données couplées pour déterminer les facteurs de prévision (prédisposant, habilitant et nécessaire) pour l'utilisation des soins à domicile et pour les décès à domicile dans le cadre d'un programme pilote, à Toronto, qui offre une*

égalité d'accès aux services de soins palliatifs à domicile. Seulement 25 % des personnes du groupe étudié (n=418) ont eu besoin de soins de courte durée à l'hôpital à la fin de leur vie, comparé à 55 % des cas de décès liés au cancer dans la même région métropolitaine.

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Changements dans l'utilisation des services de physiothérapie par la population active : répercussions sur l'accessibilité pour les adultes canadiens en âge de travailler

SHEILAH HOGG-JOHNSON, DONALD C. COLE, HYUNMI LEE, DORCAS E. BEATON, CAROL KENNEDY, PETER SUBRATA ET THE WORKPLACE UPPER EXTREMITY RESEARCH GROUP

*Les auteurs ont étudié les données sur les réclamations relatives aux soins de physiothérapie pour les troubles musculosquelettiques en Ontario. Alors que le lieu de travail syndiqué qui faisait partie de l'étude offrait des services sur place, la stratégie de l'utilisateur-payeur pour des services externes de physiothérapie est en croissance, ce qui soulève la question des inégalités d'accès pour les travailleurs qui n'ont pas d'assurance privée ou qui ne sont pas en milieu de travail syndiqué.*



Examen par les pairs



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## How to Set the World on Fire

**T**HE YEAR 2010 WAS A BUSY ONE, BUT I DIDN'T EXPECT IT TO GO OUT WITH A BANG – literally. I was visiting friends in Copenhagen to celebrate the new year. We were getting ready to start the countdown to midnight when the building shook. Puzzled, we looked outside to find that someone on the street below had accidentally shot a firework into the apartment building. Luckily, its builders made sure, decades ago, that its structure was sturdy, and the rocket hit a wall, not a window. It took only a moment before the pyrotechnic display resumed, this time striking a building on the other side of the street.

I couldn't help thinking that setting off elaborate fireworks on a residential street, likely after having drunk too much to walk a straight line, would get you arrested in many parts of the world, whereas in Copenhagen on New Year's Eve, it was no cause for alarm. On the other hand, crossing one of the city's streets against a red light, even if there are no cars in sight, is likely to get you a lecture from a passer-by.

Health practices and policy also provide many examples of diverging and changing expectations for what falls within accepted norms. Think about smoking in public places, care for elders or how best to treat any number of health problems. In my mind, many of the interesting questions are about change, and what either impedes or promotes it. For example, how do clinical innovations progress to evidence-based practice and, from there, to incorporation into practice guidelines and acceptance as standards of care? How does an idea become "the way we do things here" or fall out of favour? Why do some ideas take off, while others stall early on?

In this issue of *Healthcare Policy/Politiques de Santé*, our authors tackle these types of questions and try to inform future practice and policy development. For example, while Stephen Duckett is no longer with Alberta Health Services, his paper on Alberta's approach to healthcare reform provides a window into the thinking behind recent developments in that province. In another paper, Michael Law and colleagues aim to inform a debate that has produced at least as many fireworks – the likely effects of changes in the pricing of generic drugs in Ontario. Likewise, Roger Chafe and colleagues look into another aspect of drug policy as they explore variations in expenditure on cancer drugs across the country.

I could go on, but citing Roger's paper allows me to mention that this issue of the journal marks his transition into *Healthcare Policy's* editorial group, taking over from Christel Woodward, whose term as an editor has come to an end. Roger is director of paediatric research in the Faculty of Medicine at Memorial University, and he brings a breadth of exper-

tise to complement that of our other editors. Please join me in welcoming him to the team and in congratulating Robyn Tamblyn, also a *Healthcare Policy* editor, on her new role as scientific director of the Institute for Health Services and Policy Research at the Canadian Institutes of Health Research.

Best wishes for 2011.

JENNIFER ZELMER, BSC, MA, PHD  
*Editor-in-chief*

—  
ÉDITORIAL

## Comment rendre le monde tout feu tout flamme

L'ANNÉE 2010 A ÉTÉ TRÈS CHARGÉE, MAIS JE NE M'ATTENDAIS PAS À CE QU'ELLE s'achève littéralement par une explosion! J'étais en visite chez des amis à Copenhague pour fêter le Nouvel An. Nous étions sur le point de faire le décompte de minuit quand tout à coup l'immeuble a été secoué. Perplexes, nous avons regardé dehors et découvert que quelqu'un dans la rue avait accidentellement envoyé un feu d'artifice sur l'édifice. Heureusement, les constructeurs s'étaient assurés de sa solidité et le pétard s'est heurté au mur en évitant les fenêtres. Peu après, le feu d'artifice a repris de plus belle pour frapper, cette fois, l'immeuble d'en face.

Je ne pouvais m'empêcher de penser que le fait d'allumer des feux d'artifices d'envergure dans la rue d'un quartier résidentiel, et probablement après avoir tellement bu que faire trois pas en ligne droite relève de l'exploit, serait passible d'arrestation dans plusieurs parties du monde, alors qu'au jour de l'An à Copenhague cela ne provoquait aucun émoi. D'un autre côté, traverser la rue sur un feu rouge, même s'il n'y a aucune voiture en vue, peut donner lieu à un sermon de la part d'un passant.

Les pratiques et les politiques de santé offrent également plusieurs exemples de divergences et de différences dans les normes jugées acceptables. Pensons à la cigarette dans les espaces publics, aux soins de santé pour les aînés ou aux meilleurs traitements pour de nombreux problèmes de santé. Selon moi, la plupart des questions intéressantes portent sur le changement et les facteurs qui le favorisent ou y font obstacle. Par exemple, comment les innova-

tions cliniques donnent-elles lieu à des pratiques fondées sur les données probantes et, par la suite, comment sont-elles incluses dans les directives et acceptées comme normes de soins? Comment une idée devient-elle « la façon de faire » ou tombe-t-elle dans l'oubli? Pourquoi certaines idées se matérialisent-elles alors que d'autres avortent dès le départ?

Dans ce numéro de *Politiques de Santé/Healthcare Policy*, les auteurs s'attaquent à ce type de questions et tentent d'éclairer l'instauration d'éventuelles pratiques ou politiques. Par exemple, bien que Stephen Duckett ne fasse plus partie d'Alberta Health Services, son article sur la démarche albertaine face à la réforme des services de santé offre un aperçu de la pensée qui sous-tend les récentes restructurations dans la province. Dans un autre article, Michael Law et ses collègues veulent éclairer un débat qui a provoqué au moins autant de feux d'artifice : les effets probables des changements du coût des médicaments génériques en Ontario. Parallèlement, Roger Chafe et ses collègues se penchent sur un autre aspect des politiques en matière de médicaments, en étudiant les variations dans les dépenses pour les médicaments pour traiter le cancer, partout au pays.

Je pourrais continuer, mais je profite de la mention de l'article de Roger pour dire que ce numéro de la revue coïncide avec son incorporation à l'équipe de rédaction de *Politiques de Santé*, où il remplace Christel Woodward dont le mandat d'éditrice est terminé. Roger est directeur de recherche en pédiatrie à la Faculté de médecine de l'Université Memorial. Il apporte donc avec lui une vaste expérience qui vient compléter celle des autres éditeurs. Veuillez vous joindre à moi pour lui souhaiter la bienvenue et pour féliciter Robyn Tamblyn, également éditrice de *Politiques de Santé*, pour son nouveau poste de directrice scientifique de l'Institut des services et des politiques de la santé des Instituts de recherche en santé du Canada.

Meilleurs vœux pour 2011.

JENNIFER ZELMER, BSC, MA, PHD  
*Rédactrice en chef*



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# Engine or Boat Anchor? The Health Professional Training Establishment in HHR Innovation

## Ancre ou pleins moteurs? Institution de formation professionnelle et innovation dans les ressources humaines en santé

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### Abstract

Educational institutions have largely failed to provide innovative responses to emerging health human resources (HHR) needs. Reasons include the prevailing ratio policy, which simply increases the supply of professionals; university funding protocols; a guild structure that isolates health professions rather than integrating them; and current credentialing for entry to practice, which both controls and further balkanizes the professions. Providing integrated health services will require (a) embedding interprofessional education and collaborative practice in accreditation requirements, (b) coordinating educational programs via intergovernmental committees and (c) embedding interprofessional collaborative learning in clinical training.

### Résumé

Les institutions d'enseignement ont échoué dans leurs propositions de réponses novatrices pour combler les besoins urgents en matière de ressources humaines en santé. Parmi les raisons derrière cet échec se trouvent les politiques de ratio qui prévalent et ne font



qu'augmenter le nombre de professionnels de la santé; les protocoles de financement dans les universités; une structure de guildes qui isole les professions de la santé au lieu de les intégrer les unes aux autres; et les processus actuels d'accréditation pour le droit de pratique, lesquels contrôlent et balkanisent davantage les professions. Pour offrir des services intégrés de santé, il faut (a) inclure la formation interprofessionnelle et la pratique collaborative dans les exigences d'accréditation, (b) coordonner les programmes de formation au moyen de comités intergouvernementaux et (c) inclure l'apprentissage collaboratif interprofessionnel dans la formation clinique.

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**P**OST-SECONDARY INSTITUTIONS ARE RENOWNED FOR SITTING AT THE CUTTING edge of orthodoxy. Tzountzouris and Gilbert (2009) discussed at some length the part that educational institutions play in identifying and responding to emerging health human resources (HHR) needs. They came under criticism for assigning these institutions a rather passive role, and failing to outline their potential for leadership. It is worth exploring briefly some possible reasons for this apparent passivity.

The past 100 years have seen a near-exponential growth in the number of different health occupations. As it is (not exactly) written in the Book of Ecclesiastes: "Of the making of many health occupations there is probably no end." It is possible that this proliferation is about to end, and we shall see no more new health occupations, but it is highly improbable. As science carves the human body into ever smaller bits, the temptation to recruit more and different workers to its management and care will probably be too great to overcome. HHR planning will continue to be challenged by the dendritic growth of those occupations – and its financial implications. (More on this below.)

These occupations now appear like snowflakes – no two are exactly alike. Yet snowflakes all share the same hexagonal template, and they are shaped by the conditions of the cloud through which they form and fall. Sounds a bit like health occupations.

In many senses, education for these occupations represents what Rittel and Webber (1973) have called a "wicked problem." Wicked problems are difficult or impossible to solve. Their solutions depend on incomplete, contradictory and changing requirements that are often difficult to recognize. And they are confounded by complex interdependencies between actors and agents. If ever there was a wicked problem, innovation in health professional training is surely it. What could be more complex than relationships between government, post-secondary institutions, the healthcare industry – and the professions?

If we think about it, from a strictly selfish point of view, it makes sense for training establishments to respond to perceived HHR shortages by saying: "You need more of our kind of graduates? Well, just give us more money and we'll be happy to give you more of them."

New money for more students buys all manner of rewards – more faculty means more research, means more prestige, means more bargaining power, means more space – and so on, ad infinitum. A demonic bargain has been struck.

*Nominandum est rutrum rutrum* – it's time to call a spade a spade. The ratio policy mostly serves the interests of the health professions themselves. The policy isn't closely correlated with the concerns of patients/clients and the care they need. Research that addresses HHR from a ratio perspective shows that such initiatives too often focus on staff types – more Xs, Ys and Zs. The initiatives are rarely focused on staff members' skills. Neither are they focused on how those skills might be used most effectively to improve patient care. We are now aware that HHR problems cannot be solved if the policy response is simply to increase supply.

Let's square this ratio issue with the growth of health occupations. As John Tzountzouris and I attempted to show, the development of new health and human services occupations is a complex mix of new knowledge, new technology, occupational aspirations – and, of course, egos. How new practitioners are prepared, organized, deployed and paid will directly influence their ability to provide high-quality care within our changing health system. And of course, training for new health occupations triggers a need for more new money and ascent on the credentials ladder.

As the 20th century passed, something became clearer and clearer to those aspiring to turn newly developed health occupations into professions that got respect. They recognized that the credential that marked entry to practice was the key to financial well-being and political influence.

Emerging health occupations accumulated new knowledge. As they did so, what had heretofore required six months of training, with perhaps a certificate at the end of it, slowly became two years of training with a diploma. As more knowledge accrued, the training period gradually crept to four years – and a first degree. Gradually and inevitably, as more knowledge was acquired, a postgraduate degree replaced the undergraduate degree. As we move into the 21st century, that first postgraduate degree seems to be inexorably moving to a professional doctorate. Steven Lewis has suggested that simply calling all health providers “doctor” might solve the whole imbroglio. Adding more degrees is not innovation that drives system change.

This credentialing issue is, without doubt, a serious problem – how do we figure it into the HHR algorithm? What we have observed is that as these credentials increase, so does the arrival of a new cadre of “helpers.” We have more chief assistants to the assistant chiefs. The federal, provincial and territorial Coordinating Committee on Entry to Practice Credentials has learned, to its regret, that stopping the increase in credentials is almost impossible in a federal system that essentially rests responsibility in the provinces.

Health professional training in Canada reflects complex relationships among government, post-secondary education and the healthcare industry. Despite the best of intentions, at times impediments between and among these players make collision inevitable and innovation very difficult.

Our health system is moving at semi-glacial speed towards providing more integrated, *interprofessional collaborative* health services. That care will require clearer, informed and effective collaboration among government, health professional training establishments, the healthcare industry and the broad array of practitioners.

Ratios and new health occupations are major challenges to innovation. But what really

contaminates this already contaminated state of affairs is the rate-limiting fixation on paying for “bums in seats” – a funding protocol that is a major impediment to innovation.

Within Canada, health ministries do not generally fund education directly.<sup>1</sup> Instead, drawing on the old ratio arguments, health ministries tell the post-secondary ministries the number of graduates needed. These numbers are usually expressed as “seats.” Post-secondary ministries then develop funding formulas to accommodate the number of graduates requested. These formulas are shared with health ministries and the various post-secondary programs within a province. Seats are then assigned to specific health education programs within universities, colleges and institutes. Over and above problems of general communication and lack of continuity, there are deep-seated barriers to innovation within this system of seat allocation. Why?

Since each seat carries a monetary value, calculated on the basis of historical precedent and type of program, there is little incentive for programs to change their educational curricula to accommodate innovations in teaching and learning, either within the institution or at sites where students learn their practice skills. The price per seat never goes down. Indeed, smart university and college administrations always look for creative ways to put the price up. Price differentials among programs can be significant. They torque the system. This torque severely impedes anything other than the development of superficial relationships between academic programs. To those programs that have, more is usually given. To those programs that have not, entering the game with innovative funding proposals is akin to entering a fortified hill town after curfew. Expect trouble.

Let’s be blunt. In 60 years, the “bums in seats” approach to HHR planning has not worked very well. We cannot continue with the notion that simply producing more Xs, Ys and Zs will fix the resource problem. To do so will mean that our planning remains seriously out of joint with those 60 years of grim reality. There are multiple 10-year plans that appear to operate on the mistaken belief that this kind of planning will achieve serenity. Trouble is – hoping for serenity is not policy.

How did we get into this mess? A couple of years ago, I took a look back at the great report of Abraham Flexner (1910) and tried to trace its influence on the development of health professions (Gilbert 2008). Flexner’s unintended legacy includes some major impediments to innovation.

The rigorous medical education envisioned by Flexner had an unintended consequence. That consequence was the development and approval of policies that fostered (and continue to foster) a balkanized guild structure across the health and human services professions. That balkanized structure imposed occupational control. The new health professions that emerged in the 20th century might well look to Flexner as their fairy godfather. Policies created to achieve two of Flexner’s goals for medicine – university affiliation and full-time faculty – were enthusiastically embraced by emerging health professions. Those policies have played out in a manner that serves to isolate professions rather than bring them together. These professional guilds present some clear realities:

- They live within their own compound of professional associations and learned journals.

- They subscribe to their own belief system through codes of ethics and scopes of practice.
- They erect intellectual fences by dictating entry-to-practice requirements.

Each of these realities inevitably interlocks with the others. Resources committed to the development of one reality spread into a need for resources to be flowed to another. They come to form a mutually reinforcing, cycling process or “virtuous circle” – a process in which a favourable circumstance (or result) gives rise to another that subsequently supports the first. Yet we know that the processes needed to train and deploy health professionals are variegated. Those processes encompass a number of different domains: the way services are funded and organized, the workplace environment, the individual needs of health professionals and population health needs. Within each of these domains there are multiple levers for policy action and multiple organizations with partial or complete responsibility for implementation. It is known that there may be at least 15 distinct policy levers and more than 15 stakeholder organizations involved in policy decisions and implementation.

Flexner’s brilliance in moving medicine into the 20th century has proved to be something of a curse. Innovations such as interprofessional education and collaborative practice are extremely difficult to promote across the barriers of guild structures (Gilbert 2005).

There is a further consequence of Flexner’s placing the study of medicine (and subsequently, many other health professions) within the university. Universities are dominated by the arts-and-science pedagogic model of education, to which the health professions are expected to conform. But this model tends to fasten wheel clamps onto education for practice, which is often relegated to a secondary role. What do I mean by this?

Academic progression through the ranks at universities, and increasingly in colleges, is driven by the requirements of teaching and research. The arts and science course-driven model of teaching does not accord well with interprofessional collaborative, patient-centred learning. Accumulating 48 credits of classroom instruction does not necessarily equate with the acquisition of competency to deliver care. Yet about 60% of student learning is spent in a classroom environment.

How could it be otherwise? Teaching performance is taken as one measure for promotion and tenure. An instructor’s research frequently forms a part of the base for that teaching. Faculty members may try both to use innovative teaching methods and to teach innovative approaches to practice. But these efforts must compete with publishing peer-reviewed papers, which remains the pre-eminent criterion for tenure and promotion.

There is, of course, another confounder. The clinical environment must provide skills that enable credentialing for entry to practice. And here the press of the traditional path also holds true. As many students tell us, the refrain, “You may learn that in your classes, but here we do it this way” is not uncommon. The division between “*them*” and “*us*” is palpable. No wonder innovation is very difficult to carry forward.

This brings me to a final impediment to innovation that confronts health professional training establishments – the almost impenetrable thicket of regulation and legislation.

Scopes and competencies are the creatures of regulation and legislation – something that

no university, college or institute program can avoid. Those creatures can both block and facilitate innovation. Professional associations play perhaps *the* most important role in determining competencies and scopes of practice. These associations work closely with regulatory and legislative bodies. They become the gatekeepers of the system.

Competencies and scopes of practice are most often developed in isolation from other professional associations. This isolation makes parts of them reduplicative and often redundant. After all, how many ways can we look at a competency labelled “communication”? As gatekeepers of competencies and scopes of practice, associations can stifle any innovation that post-secondary institutions might wish to introduce.

So with this, my personal list of impediments (which might account for the “passivity” in our original paper), do I see any possible facilitators for HHR innovation?

My first choice for motivating change would be to address professional accreditation. Ultimately, competencies and scopes insinuate themselves into accreditation. If I could choose one mechanism that might support innovation, it would be through existing accreditation protocols of both health education programs and health services programs. I suggest that innovations in ways of learning will take hold only when those innovations are embedded in accreditation. There is no threat more likely to cause deans of faculties (and presidents of universities, colleges and institutes) to have sleepless nights than loss of accreditation. Embedding interprofessional education and collaborative practice in accreditation requirements would have a much greater chance of downstream effects on regulation and legislation.

What gives me hope? Broad and growing awareness of the issue is reflected in several recent reports from a variety of agencies:

- ✦ the Accreditation and Interprofessional Health Education initiative funded by Health Canada (AIPHE 2009);
- ✦ the Association of Faculties of Medicine of Canada (AFMC 2010);
- ✦ the World Health Association (WHO 2010);
- ✦ the Western Canadian Interprofessional Health Collaborative (Suter and Deutschlander 2010); and
- ✦ the Canadian Medical Protective Association (CMPA 2010).

My second choice for the facilitation of innovation would be intergovernmental committees and the coordination of educational programs. Canada has a mixed model of private and public policy levers to manage both our overall health system and the processes by which health professionals are trained and deployed. This approach can be at odds with achieving optimal supply, mix and distribution of skills. Only intergovernmental committees can grapple with the kinds of issues I have outlined and produce policies that assign resources to supply in new and imaginative ways. To borrow Willie Sutton’s famous justification for robbing banks – the ministries are where the money is.

My final choice for the facilitation of innovation would be the establishment of what are called collaborative learning units (CLUs) within health services settings. We need, I think

desperately, to try some new approaches to practice education so that every student's knowledge and skills are both interprofessional and collaborative. Health Canada is funding three major trials across the country of CLUs – an attempt to embed interprofessional collaborative learning in clinical training.

These new units have the potential to influence policy making in a very real way. But we need evidence that this new way of learning actually results in better quality of care. CLUs provide an opportunity for researchers to set up defined evaluation programs and processes, so that evidence can be gathered that fills some of the gaps in our current understanding of interprofessional collaboration. With careful forethought and planning, CLUs could change the way we think about and perform clinical training. This said, however, I am painfully aware of the sceptics in their corners. You know – the ones who say: “I don't believe it; prove it to me and I still won't believe it.”

The health workforce is claimed to be the most highly educated in modern societies. But that education too often runs along parallel tracks that never meet. To improve the effectiveness of – and the “value for money” from – that educational investment, we shall have to develop innovative ways of education and training. And those ways will need to recognize the vast range of similarities among the multiplicity of professional preparations, rather than emphasizing the differences. (The snowflake may be an apt analogy.) The necessary changes will require continued patience and perseverance.

#### ACKNOWLEDGEMENTS

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#### NOTE

1. There are some exceptions. The Faculty of Medicine at Memorial University and the Michener Institute for Applied Health Sciences in Toronto are both funded directly by their respective ministries of health.

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# Getting the Foundations Right: Alberta's Approach to Healthcare Reform

## Construire des fondations solides : démarche face à la réforme de la santé en Alberta

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### Abstract

Alberta's abolition of its health regions and the creation of Alberta Health Services in 2008 has integrated previously disparate providers of healthcare services. The long-term benefits of this "second-wave" approach to health systems structuring include lower administrative costs, greater equity of access, improved intraprovincial learning and economies of scale. Some benefits have begun to be realized but, as with any merger, performance should be judged over a multi-year time frame.

### Résumé

L'abolition des autorités sanitaires régionales en Alberta et la création d'Alberta Health Services en 2008 a conduit à l'intégration d'une variété de fournisseurs de services de santé auparavant séparés. Les avantages à long terme de cette « deuxième vague » de structuration des systèmes de santé comprennent des coûts administratifs moins élevés, une plus grande égalité d'accès, un meilleur apprentissage intraprovincial et des économies d'échelle. Certains avantages commencent à prendre forme mais, comme dans toute fusion, il faudrait évaluer le rendement sur une période couvrant plusieurs années.



THE MERGER OF THE 12 FORMER HEALTH ENTITIES PREVIOUSLY RESPONSIBLE FOR healthcare delivery in Alberta (population less than 4 million) has attracted a lot of attention across Canada, including Cameron Donaldson's critique in a recent issue of *Healthcare Policy/Politiques de santé* (Donaldson 2010). Despite the title of his paper, the creation of Alberta Health Services (AHS) cannot by any stretch of the imagination be described as "disintegration." Rather, this integration of previously disparate entities offering mental health, addictions, cancer and emergency medical services with those provided by the former regions will be one of the long-term benefits of the merger.

Donaldson identifies three "real questions" that provide a good framework for both his paper and this response:

- Why did Alberta make such a move?
- How did the province intend to achieve its stated aims?
- Did it in fact achieve these? (Donaldson 2010: 23)

Alberta is a relatively high-spending province in terms of age–gender adjusted per capita public health expenditure (based on CIHI data). But its health-adjusted life expectancy is below the Canadian average, and it is on the wrong side of the Canadian average on most access measures, patient satisfaction and a number of outcome measures (Duckett et al. 2011). So, clearly, change of some kind is necessary.

As Donaldson points out, there were other problems with the previous structures:

- "It may well be that the health regions in Alberta were culpable for not coming to grips with how to manage their fixed funding envelopes in order to best meet population needs." (Donaldson 2010: 28)
- "... that rather than a failure of the regional structures that were in place, what Alberta experienced was a failure of leadership, not only of the regions but also at the political level." (Donaldson 2010: 29)

Alberta was not the first political entity to recognize that regional experiments were failing, and Saltman (2008) has argued that the recentralization occurring in a number of countries may herald the start of the next "long wave" of structural reform. Alberta's new model is consistent with this "second-wave" approach to health system structuring and is likely to have similar benefits and challenges (Duckett 2010).

## Administrative Costs

Donaldson highlights and dismisses one justification for integration – relatively higher administrative costs (Donaldson 2010: 24–25). The data he advances are for administrative costs relative to total public and private expenditure, which is influenced by many factors, including policy and personal choices not affected by efficiency (or non-efficiency) of entities charged with delivery of public services. However, even using this measure, Alberta might be high-

lighted for further scrutiny: as would be expected given likely scale economies, the three larger provinces are the cheapest in terms of per capita administrative costs, but three smaller provinces are also cheaper than Alberta.

But administrative costs are one of the prime areas where benefits might be seen. Every previous entity, for example, would have its own chief financial officer, human resources group and so on. Economies of scale are to be expected in areas with significant numbers of transactions.

Many administrative savings can be realized relatively quickly, especially through the elimination of duplicate senior positions. Because each of the former health entities was required to publish information about salary costs of staff annually, as is AHS, it is possible to compare costs of senior management staff before and after the merger.

Table 1 (<http://www.longwoods.com/content/22176>) shows spending on the top three management levels of AHS (in 2009/10 dollars) and the former health entities (2007/08 data, the last year before the merger). There has been about a 9% rise in salaries since then (4.5% in 2008/09 and 4.3% in 2009/10), so the data here underestimate the differences pre- and post-merger. Unfortunately, the guidance for these reports led to some variability in reporting (e.g., Capital Health didn't report any managers reporting at the third level).

The table shows that AHS expenditure on senior management is less than 30% of the aggregate of the former entities. So despite having a vice-president for cancer care included in the above numbers (Donaldson 2010: 24), the other infrastructure of the former Cancer Board has not been duplicated in the new AHS structure.

## Merger Benefits

Donaldson's second question asks how we would expect to achieve benefits from the merger. There are three main types of changes that should lead to benefits over time.

First is intraprovincial equity. The previous regional health authorities made local decisions, reflecting local priorities. Inevitably, the decisions differed. In turn, this meant different services were expanded (or existed) in different regions, and Albertans had differential access to services depending on where they lived. Cataract surgery is a case in point. The former Calgary Health Region funded fewer cataract operations than the former Capital Health Region. The consequence was longer wait times in Calgary compared to Edmonton. It is now the job of AHS to iron out these differences.

The second benefit is improved intraprovincial learning. The previous entities had national reputations for innovation in many fields, but these innovations often did not flow across the province. If a good idea is generated and implemented in Grande Prairie, it should be implemented in Medicine Hat, and so on. The demise of regional rivalries helps here, but so too does AHS's new structures (e.g., in two cases senior vice-presidents are responsible for hospitals in both Edmonton and Calgary, and one senior vice-president is responsible for all regional hospitals). AHS has also established clinical networks to take a provincial perspective.

The third benefit relates to efficiencies and economies of scale. AHS has already accrued significant benefits from the merger in procurement savings, and Table 1 displays the benefits of scale economies in terms of leadership positions. The larger scale also allows AHS to do

things that no other health authority in Canada can do.

Three examples:

- Alberta Health Services is moving to introduce activity-based funding in a number of areas. Activity-based funding (erroneously described by Donaldson as “case-based costing”) involves developing a formula to take account of the different needs of a patient or resident and then funding the service or hospital according to those needs. The cost for a hospital patient who has a transplant is obviously more than the cost for removing an appendix, and the hospital that does more of the former should have a larger budget for treating those patients. Activity-based funding works best when there are multiple organizations to compare and contrast. You need a largish number of organizations to participate in activity-based funding to develop a sensible system and effective funding formula, with appropriate comparisons and benchmarks.
- A second example is the creation of a single acute care provincial drug formulary. The previous nine health regions and the Alberta Cancer Board each maintained separate drug formularies for use within its own area of control. This approach resulted in significant duplication of effort related to the evaluation and addition of drugs to the formulary, and to maintenance of systems associated with drug use. Alberta is now the only province with a single acute care formulary. Having a single provincial drug formulary improves patient care and safety by ensuring that optimal drug therapies are utilized. It also reduces safety risks associated with employees who work for more than one health service (each with a different formulary), minimizes duplication and realizes financial savings from contract consolidation.
- Analysis and promotion of safety is yet another example. AHS can now compare safety performance across a number of hospitals using statistical process-control approaches. Again, this strategy relies on having enough information from a larger number of hospitals to provide robust benchmarks.

## Achievements

Finally, Donaldson questions achievement. Unfortunately, it is too early to expect to see measurable benefits in access or outcomes at this stage.

AHS is now the largest publicly funded healthcare provider in Canada, by a significant margin. The full benefits of the merger should not be expected to be seen within a year. Shifting priorities and rolling out lessons from one part of the province to another will take time. As indicated above, some benefits have already begun to be realized, but as with any merger, benefit realization should be judged over a multi-year time frame.

Alberta's previous structural initiatives were watched closely by the other provinces and have been the subject of academic evaluations (Hinings et al. 2003; Philippon and Wasylshyn 1996; Reay and Hinings 2005). Such scrutiny is welcomed and encouraged. But academic (as opposed to journalistic) critique should be undertaken over a reasonable time frame. Donaldson's pessimistic conclusions and predictions about the AHS merger are way

too premature and thus cannot be soundly based.

Readers would be well advised to withhold judgment about the AHS merger until a more rigorous evaluation is possible.

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Getting the Foundations Right: Alberta's Approach to Healthcare Reform

**TABLE 1.** Remuneration for senior management staff of former health entities, year ending through 2008, AHS year ending March 2010 (\$'000s)

	Former health entities, 2008/09												AHS	
	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Cancer Board	Alberta Mental Health Board	Alberta Alcohol and Drug Abuse Commission		Subtotal
President & CEO	565	454	1,335	422	170	915	305	360	380	712	282	289	6,189	744
Other board and CEO direct reports	1,864	1,205	4,332	1,516	1,084	3,095	983	1,584	1,583	2,343	838	517	20,944	5,063
Managers directly reporting to above	1,684	3,666	5,361	5,787	2,054	-	3,804	1,160	1,155	4,207	1,492	-	30,370	10,691
Total	4,113	5,325	11,028	7,725	3,308	4,010	5,092	3,104	3,118	7,262	2,612	806	57,503	16,498

# Access to Cancer Drugs in Canada: Looking Beyond Coverage Decisions

Accès aux médicaments pour traiter le cancer au Canada :  
voir au-delà des décisions concernant la couverture



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## **Abstract**

**Objective:** To examine variation in patients' access to a set of cancer drugs through publicly funded provincial drug programs.

**Data Sources/Study Design:** We surveyed provincial drug program managers about their highest-expenditure intravenous and oral cancer drugs. We then investigated whether the same cancer drugs account for the highest expenditures across the provincial programs. We also compared the rates at which these drugs are accessed through these programs.

**Principal Findings:** While there is moderate consistency in the selection of cancer drugs that account for the highest provincial expenditures, considerable differences were found in the rates at which some drugs are accessed across provincial programs.

**Conclusions:** The study demonstrates the existence of interprovincial variation in publicly funded access to cancer drugs even after these drugs have been approved for public coverage.

## Résumé

**Objectif :** Examiner la variation dans l'accès des patients à un ensemble de médicaments pour traiter le cancer, par le biais de programmes d'assurance médicaments provinciaux financés par les fonds publics.

**Sources de données/concept de l'étude :** Nous avons effectué un sondage auprès de gestionnaires de programmes d'assurance médicaments provinciaux pour connaître leurs coûts de dépense les plus élevés quant aux médicaments pour traiter le cancer administrés par voie intraveineuse et orale. Nous avons ensuite comparé les résultats pour savoir si les mêmes médicaments entraînent les coûts les plus élevés parmi tous les programmes d'assurance médicaments provinciaux. Nous avons aussi comparé les taux auxquels ces médicaments sont obtenus à travers ces programmes.

**Principaux résultats :** Bien qu'il existe une certaine cohérence dans la liste des médicaments qui entraînent les plus grandes dépenses pour les provinces, des différences considérables ont été observées dans les taux auxquels certains médicaments sont obtenus entre les différents programmes provinciaux.

**Conclusions :** L'étude démontre l'existence d'une variation interprovinciale dans l'accès aux médicaments financés par les fonds publics, et ce, même après que ces médicaments aient été approuvés dans le cadre d'une couverture publique.

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**G**IVEN THE HIGH COST OF MANY CANCER DRUGS, PATIENTS IN CANADA OFTEN are forced to rely on publicly funded drug programs in order to obtain care. These programs are independently run by the provinces, with each provincial government determining the structure and eligibility requirements for its own programs. These programs also independently decide which drugs will be eligible for public coverage in each province. This situation can result in cancer patients in different provinces having differential access to care.

Previous studies examining variation in access to cancer drugs have focused primarily on whether particular drugs are covered by provincial drug programs. These studies have found considerable variation in public coverage both for specific drugs (Khoo et al. 2007; Menon et al. 2005; Verma et al. 2007) and within the categories of drugs covered for various populations (Canadian Cancer Society 2009). Yet, even when provincial programs similarly agree to cover a drug, there can still be significant variation in patients' access. Although these post-coverage variations in access are less noticeable than those arising because drugs have been categorically included in or excluded from coverage, they raise similar concerns regarding equitable access



and quality of care. To explore further the extent to which cancer patients in different provinces have differential access to care, we examined variations in the rate at which patients access a set of cancer drugs through the various provincially funded drug programs.

## Method

Because some provinces provide coverage for intravenous and non-intravenous (including oral) cancer drugs through separate drug programs, we surveyed provincial drug plans for both intravenous and oral agents. We initially considered surveying the drug plans about a fixed list of cancer drugs to compare variation, similar to the approach taken by Khoo and colleagues (2007). We ultimately chose, however, to focus the survey on the top 10 oral and intravenous drugs by expenditure specific to each province. This variation was of most interest to the cancer system policy makers with whom we discussed the project. Furthermore, the top 10 drugs account for a very high proportion of total cancer drug expenditures (e.g., the top 10 intravenous cancer drugs often account for more than 90% of total program expenditures on these drugs). We were also advised that many provincial drug programs lacked the ability to provide more extensive data, so requesting information about a longer list of drugs would likely have substantially reduced the survey's response rate.

Each program manager was asked to identify the 10 intravenous and 10 oral cancer drugs accounting for the greatest expenditure in his or her province during the 2006–2007 fiscal year. Managers were asked also to itemize the annual provincial expenditure on each drug and the number of patients within their province receiving public reimbursement for the drug during that period. Reminder e-mails and follow-up telephone calls were made to survey non-respondents over a period of three months.

## Results

Eight provincial drug program managers provided data on the top 10 intravenous cancer drugs by total expenditure (Table 1, see <http://www.longwoods.com/content/22177>). Five intravenous cancer drugs – trastuzumab (Herceptin), rituximab (Rituxan), docetaxel (Taxotere), irinotecan (Camptosar) and gemcitabine (Gemzar) – were listed by all eight provincial programs that reported data. Paclitaxel (Taxol) and bortezomib (Velcade) were listed in the top 10 of seven programs. Oxaliplatin (Eloxatin) and epirubicin (Pharmorubicin) were listed by six of the programs.

We compared the number of top 10 intravenous drugs that each program had in common with programs in other provinces. Based on a similar interpretation of kappa statistics to that of McGinn and colleagues (2004), we categorized provinces as having “fair” agreement if they had five of the 10 drugs in common, “moderate” agreement when there were six or seven drugs in common, “substantial” agreement if they had eight or nine drugs in common and “perfect” agreement if they had the same 10 drugs listed. The number of drugs that provinces had in common ranged from five to nine, with many provinces showing substantial agreement, but no two provinces having perfect agreement. For intravenous drugs, the average was 7.8 drugs in common, indicating “moderate” to “substantial” agreement among the provinces in terms of the

drugs on which they spent the most during the study period.

Six drug program managers provided data on oral cancer drugs (Table 2). Four oral cancer drugs – imatinib (Gleevec), anastrozole (Arimidex), capecitabine (Xeloda) and letrozole (Femara) – were in the top 10 for all six provincial programs for which data were provided. Temozolomide (Temodal) was listed in the top 10 for five of the six programs. The average number of drugs in common was 5.9, indicating “fair” to “moderate” agreement among the programs.

**TABLE 2.** Top 10 oral cancer drugs by total provincial expenditure for 2006–2007 (per capita spending on each drug in brackets)

	BC	AB	SK	ON	NS	NL
1	Imatinib (Gleevec) \$9,758,620 (\$2.37)	Leuprolide Gel \$9,624,705 (\$2.93)	LHRH Analogs \$3,226,730 (\$3.33)	Imatinib (Gleevec) \$19,124,044 (\$1.57)	Goserelin (Zoladex) \$1,554,624 (\$1.70)	Imatinib (Gleevec) \$587,594 (\$1.16)
2	Goserelin (Zoladex) \$7,047,846 (\$1.71)	Imatinib (Gleevec) \$6,623,894 (\$2.01)	Imatinib (Gleevec) \$2,113,799 (\$2.18)	Anastrozole (Arimidex) \$10,268,736 (\$0.84)	Leuprolide \$1,035,401 (\$1.13)	Bicalutamide \$214,669 (\$0.42)
3	Leuprolide \$5,599,655 (\$1.36)	Temozolomide (Temodal) \$2,035,920 (\$0.62)	Filgrastim (G-CSF-Neupogen) \$1,350,677 (\$1.40)	Bicalutamide \$8,923,072 (\$0.73)	Imatinib (Gleevec) \$804,872 (\$0.88)	Erlotinib (Tarceva) \$91,642 (\$0.18)
4	Anastrozole (Arimidex) \$3,243,415 (\$0.79)	Capecitabine (Xeloda) \$1,708,605 (\$0.52)	Temozolomide (Temodal) \$562,519 (\$0.58)	Letrozole (Femara) \$5,721,234 (\$0.47)	Anastrozole (Arimidex) \$706,940 (\$0.77)	Anastrozole (Arimidex) \$88,370 (\$0.17)
5	Octreotide (Sandostatin) \$3,182,578 (\$0.77)	Anastrozole (Arimidex) \$1,587,286 (\$0.48)	Octreotide (Sandostatin) \$536,519 (\$0.55)	Temozolomide (Temodal) \$5,685,141 (\$0.47)	Bicalutamide \$610,836 (\$0.67)	Capecitabine (Xeloda) \$73,568 (\$0.15)
6	Letrozole (Femara) \$2,594,166 (\$0.63)	Letrozole (Femara) \$1,066,913 (\$0.32)	Anastrozole (Arimidex) \$516,696 (\$0.53)	Capecitabine (Xeloda) \$4,294,417 (\$0.35)	Letrozole (Femara) \$330,487 (\$0.36)	Letrozole (Femara) \$64,807 (\$0.13)
7	Temozolomide (Temodal) \$2,554,144 (\$0.62)	Thalidomide \$991,811 (\$0.30)	Capecitabine (Xeloda) \$427,256 (\$0.44)	Methotrexate \$2,332,915 (\$0.19)	Temozolomide (Temodal) \$290,825 (\$0.32)	Tamoxifen \$33,530 (\$0.07)

TABLE 2. Continued.

	BC	AB	SK	ON	NS	NL
8	Capecitabine (Xeloda) \$2,554,144 (\$0.62)	Interferon \$837,077 (\$0.25)	Interferon \$212,617 (\$0.22)	Erlotinib (Tarceva) \$2,311,408 (\$0.19)	Capecitabine (Xeloda) \$250,552 (\$0.27)	Hydroxycarbamide \$30,794 (\$0.06)
9	Exemestane (Aromasin) \$1,287,568 (\$0.31)	Erlotinib (Tarceva) \$750,113 (\$0.23)	Letrozole (Femara) \$199,950 (\$0.21)	Exemestane (Aromasin) \$1,566,691 (\$0.13)	Buserelin \$182,180 (\$0.20)	Megestrol (Megace) \$19,461 (\$0.04)
10	Buserelin \$1,270,427 (\$0.31)	Fludarabine \$571,044 (\$0.17)	Ondansetron/Granisetron \$180,651 (\$0.19)	Megestrol (Megace) \$1,490,249 (\$0.12)	Methotrexate \$180,816 (\$0.20)	Exemestane (Aromasin) \$18,009 (\$0.04)

For the five intravenous and four oral drugs for which all the reporting provinces provided data, we examined variation in their utilization. This analysis was constrained by the fact that only six provinces provided any data on the number of patients obtaining the drugs during the study period.

Table 3 shows the utilization rate per 100,000 population for each drug for provinces that reported patient utilization data.

TABLE 3. Number of patients per 100,000 population receiving a cancer drug through a public drug program for selected high-expenditure cancer drugs

Drug	Type	Provinces						Mean Number per 100,000 Receiving Drug	Coefficient of Variation
		BC	AB	MB	SK	ON	NL		
Anastrozole	Oral	60.3	28.6	×	39.2	58.2	13.9	40.0	49.3%
Letrozole	Oral	50.5	24.1	×	19.8	32.5	10.3	27.4	55.3%
Docetaxel	IV	21.3	19.5	22.5	19.7	23.7	×	21.3	8.4%
Rituximab	IV	25.7	14.3	24.4	20.0	18.7	×	20.6	22.1%
Gemcitabine	IV	24.0	10.3	18.7	23.5	15.4	×	18.4	31.2%
Capecitabine	Oral	28.1	18.4	×	18.3	14.3	4.8	16.8	50.2%
Trastuzumab	IV	20.0	12.8	17.2	15.9	17.4	×	16.7	15.8%
Irinotecan	IV	13.6	9.2	20.7	16.2	15.3	×	15.0	27.8%
Imatinib	Oral	8.3	6.6	×	9.0	5.0	3.2	6.4	37.2%

## Interpretation

Access to cancer drugs in Canada is complicated. Previous studies have examined differences in coverage between provinces or have pointed out gaps in eligibility for coverage for some types of cancer drugs. Our study expanded on this work by examining variations in access to the cancer drugs funded through provincial drug programs. This study thus captures the combined effect of coverage decisions for specific drugs, eligibility requirements of public coverage and other factors that may affect access through publicly funded drug programs in each province.

We found moderate to substantial agreement in the cancer drugs accounting for the highest expenditures across provincial programs. This level of agreement existed notwithstanding the variation in eligibility for public coverage during the survey period. For example, bevacizumab (Avastin) was one of the top 10 highest-expenditure drugs in only two provinces: British Columbia and Newfoundland and Labrador. These provinces, however, were the only two that covered bevacizumab during the study period. This level of agreement among high-expenditure drugs suggests that there may be less variation in access to many key cancer drugs than has been suggested by other studies (Menon et al. 2005). In other words, despite the concern about variations in access across the provinces, the provincial drug programs do generally spend the majority of their budgets on the same small portfolio of drugs.

Our data also show the impact that different program structures have on the rate of publicly funded drug utilization among the provinces. For example, there is almost a threefold difference between Saskatchewan (which offers universal coverage) and Newfoundland (which offers coverage for oral cancer drugs only to those who qualify for its general pharmaceutical assistance program) in the rate at which patients receive imatinib (Gleevec). Given that the average annual cost per patient of imatinib reported in our survey was \$30,268, these differences in the rates of access across the publicly funded drug programs clearly raise difficult equity issues and can have significant financial implications for individual patients. We also found, however, large variation in utilization for some drugs between programs with similar eligibility structures. British Columbian data indicate that 60 patients per 100,000 population receive anastrozole (Arimidex) through their public drug program compared with 29 patients per 100,000 population in Alberta, even though both provinces offer universal coverage. Further clinical, epidemiological and administrative analyses are needed to determine the reasons for variations concerning specific drugs when provincial drug coverage is similar and to determine whether opportunities exist for improving the effectiveness and efficiency of care (Blumenthal 1994).

A key barrier to understanding the reasons for variation is the lack of information systems for capturing the required data. It was notable that several provinces reported difficulties retrieving even basic information about drug utilization, including the number of patients who are obtaining them through public drug programs and the condition for which a patient is receiving a drug. Although most drug program managers indicated a willingness to be involved in the survey, it took over 10 months for some of them to compile and submit the data. Given the amount of public resources being spent on cancer drugs (see Tables 1 and 3) and their importance in patient care, there needs to be better data capture by many of the provincial drug programs to ensure that these drugs are being used effectively and efficiently.

## Conclusion

Interprovincial variation in access to cancer drugs is often presented as a criticism of provincial drug programs (Brach 2008; Priest 2007). The Pan-Canadian Oncology Drug Review, which aims to better coordinate the review of cancer drugs across nine of the 10 provinces, is a step in the right direction (Government of Ontario 2010) and may lead to more convergence in coverage recommendations, as seems to have occurred for other pharmaceuticals following the establishment of the Common Drug Review (Tierney and Manns 2008). Our study, however, illustrates that there are other important variations in Canadians' publicly funded access to cancer drugs, even after these drugs have been approved for public coverage, which need to be examined further. An important focus of future research should be on the effect that these interprovincial variations have on patients' ultimate access to these drugs (Berry et al. 2007) and on patient outcomes. After all, the Canadian healthcare system is based on the ideal that access to care should be based on need rather than place of residence or ability to pay. Policy makers need to recognize that there is more involved in ensuring equitable access to these drugs than simply taking the first step of making them eligible for public coverage.

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## Access to Cancer Drugs in Canada: Looking Beyond Coverage Decisions

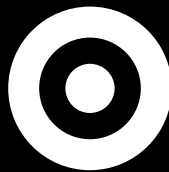
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**TABLE 1.** Top 10 intravenous cancer drugs by total provincial expenditure for 2006–2007 (per capita spending on each drug in brackets)

	BC	AB	SK	MB	ON	NB	NS	NL
1	Trastuzumab (Herceptin) \$18,898,738 (\$4.59)	Trastuzumab (Herceptin) \$11,782,800 (\$3.58)	Trastuzumab (Herceptin) \$4,087,800 (\$4.22)	Trastuzumab (Herceptin) \$4,680,202 (\$4.08)	Trastuzumab (Herceptin) \$51,328,968 (\$4.22)	Rituximab (Rituxan) \$3,226,644 (\$4.42)	Trastuzumab (Herceptin) \$3,240,000 (\$3.55)	Oxaliplatin (Eloxatin) \$2,306,228 (\$4.56)
2	Rituximab (Rituxan) \$14,790,871 (\$3.60)	Rituximab (Rituxan) \$7,926,078 (\$2.41)	Rituximab (Rituxan) \$2,686,833 (\$2.78)	Rituximab (Rituxan) \$3,466,541 (\$3.02)	Rituximab (Rituxan) \$30,788,293 (\$2.53)	Trastuzumab (Herceptin) \$2,347,910 (\$3.22)	Rituximab (Rituxan) \$3,117,328 (\$3.41)	Trastuzumab (Herceptin) \$2,019,600 (\$4.00)
3	Oxaliplatin (Eloxatin) \$8,468,959 (\$2.06)	Docetaxel (Taxotere) \$5,029,310 (\$1.53)	Irinotecan (Camptosar) \$1,030,772 (\$1.06)	Irinotecan (Camptosar) \$1,946,533 (\$1.69)	Docetaxel (Taxotere) \$16,839,367 (\$1.38)	Oxaliplatin (Eloxatin) \$1,440,550 (\$1.97)	Docetaxel (Taxotere) \$1,148,518 (\$1.26)	Bevacizumab (Avastin) \$1,870,000 (\$3.70)
4	Bevacizumab (Avastin) \$5,228,970 (\$1.27)	Oxaliplatin (Eloxatin) \$1,534,004 (\$0.47)	Docetaxel (Taxotere) \$945,866 (\$0.98)	Docetaxel (Taxotere) \$1,499,354 (\$1.31)	Irinotecan (Camptosar) \$9,750,406 (\$0.80)	Docetaxel (Taxotere) \$1,023,054 (\$1.40)	Irinotecan (Camptosar) \$869,688 (\$0.95)	Docetaxel (Taxotere) \$1,180,168 (\$2.33)
5	Docetaxel (Taxotere) \$4,893,147 (\$1.19)	Epirubicin (Pharmorubicin) \$1,509,866 (\$0.46)	Oxaliplatin (Eloxatin) \$871,186 (\$0.90)	Paclitaxel (Taxol) \$1,080,120 (\$0.94)	Gemcitabine (Gemzar) \$5,650,068 (\$0.46)	Irinotecan (Camptosar) \$515,452 (\$0.71)	Oxaliplatin (Eloxatin) \$787,733 (\$0.86)	Irinotecan (Camptosar) \$585,680 (\$1.16)
6	Gemcitabine (Gemzar) \$2,958,344 (\$0.72)	Irinotecan (Camptosar) \$1,485,473 (\$0.45)	Gemcitabine (Gemzar) \$692,074 (\$0.71)	Goserelin (Zoladex) \$604,706 (\$0.53)	Paclitaxel (Taxol) \$4,419,378 (\$0.36)	Gemcitabine (Gemzar) \$457,409 (\$0.63)	Gemcitabine (Gemzar) \$755,321 (\$0.83)	Epirubicin (Pharmorubicin) \$528,612 (\$1.05)
7	Irinotecan (Camptosar) \$2,235,550 (\$0.54)	Gemcitabine (Gemzar) \$1,434,366 (\$0.44)	Paclitaxel (Taxol) \$581,457 (\$0.60)	Gemcitabine (Gemzar) \$579,406 (\$0.50)	Epirubicin (Pharmorubicin) \$3,814,767 (\$0.31)	Bortezomib (Velcade) \$435,690 (\$0.60)	Epirubicin (Pharmorubicin) \$491,143 (\$0.54)	Rituximab <sup>1</sup> (Rituxan) \$315,356 (\$0.62)
8	Paclitaxel (Taxol) \$1,519,913 (\$0.37)	Bortezomib (Velcade) \$1,144,368 (\$0.35)	Doxorubicin Liposome (Caelyx) \$308,716 (\$0.32)	Leuprolide Acetate (Eligard) \$536,874 (\$0.47)	Bortezomib (Velcade) \$3,534,746 (\$0.29)	Cetuximab (Erbix) \$417,215 (\$0.57)	Doxorubicin Pegylated (Adriamycin) \$456,244 (\$0.50)	Gemcitabine (Gemzar) \$260,040 (\$0.51)
9	Epirubicin (Pharmorubicin) \$1,504,916 (\$0.37)	Doxorubicin Liposome (Doxil) \$752,666 (\$0.23)	Epirubicin (Pharmorubicin) \$268,184 (\$0.28)	Leuprolide Acetate (Eligard) \$512,221 (\$0.45)	Pamidronate (Aredia) \$3,423,262 (\$0.28)	Epirubicin (Pharmorubicin) \$368,835 (\$0.51)	Paclitaxel (Taxol) \$307,977 (\$0.34)	Doxorubicin Liposome (Caelyx) \$150,000 (\$0.30)
10	Bortezomib (Velcade) \$1,175,440 (\$0.29)	Paclitaxel (Taxol) \$712,595 (\$0.22)	Bortezomib (Velcade) \$160,706 (\$0.17)	Bortezomib (Velcade) \$335,034 (\$0.29)	Zoledronic Acid \$2,585,663 (\$0.21)	Paclitaxel (Taxol) \$251,173 (\$0.34)	Bortezomib (Velcade) \$280,794 (\$0.31)	Cisplatin \$128,720 (\$0.25)

<sup>1</sup> Does not reflect total provincial expenditure.

# Geographic Accessibility of Community Pharmacies in Ontario

## Accessibilité géographique aux pharmacies communautaires en Ontario



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### Abstract

*Background:* Proximity is an important component of access to healthcare services. Recent changes in generic pricing in Ontario have caused speculation about pharmacy closures. However, there is little information on the current geographic accessibility of pharmacies. Therefore, we studied geographic access to pharmacies and modelled the impact of possible closures.

*Methods:* We used location data on the 3,352 accredited community pharmacies from the



Ontario College of Pharmacists and population estimates at the census dissemination block level. Using network analysis, we determined the share of Ontario's population who reside in a census dissemination block within three road travel distances of a community pharmacy: 800 m (walking), 2 km and 5 km (driving). We then simulated the effects on these measures of 10% to 50% reductions in the number of community pharmacies in Ontario.

*Results:* Approximately 63.6% of the Ontario population reside in a dissemination block located within walking distance of one or more pharmacies; 84.6% and 90.7% reside within 2-km and 5-km driving distances, respectively. Randomly removing 30% of Ontario's community pharmacies reduces these estimates to 56.0%, 81.4% and 89.0% for each distance, respectively; a 50% reduction results in 48.3%, 77.1% and 87.2%, respectively.

*Conclusions:* Pharmacies are geographically accessible for a majority of the Ontario population. Moreover, it appears that modest closures would have only a small impact on geographic access to pharmacies. However, closures may have other impacts on access, such as cost, waiting time and reduced patient choice.

### Résumé

*Contexte :* La proximité est un aspect important de l'accès aux services de santé. Les récents changements dans le prix des médicaments génériques, en Ontario, ont mené à des suppositions sur d'éventuelles fermetures de pharmacies. Cependant, il y a peu d'information sur l'accessibilité géographique actuelle. Ainsi, nous avons étudié l'accès géographique aux pharmacies et nous avons effectué une modélisation de l'impact d'éventuelles fermetures.

*Méthodologie :* Nous avons utilisé les données sur l'emplacement de 3,352 pharmacies communautaires inscrites auprès de l'Ordre des pharmaciens de l'Ontario ainsi que les prévisions démographiques au niveau de l'îlot de diffusion de recensement. Au moyen de l'analyse de réseau, nous avons déterminé la proportion de la population ontarienne qui réside dans un îlot de diffusion à une distance de trois rues d'une pharmacie communautaire : 800 m (à pied), 2 km et 5 km (en voiture). Nous avons ensuite simulé l'effet, sur ces mesures, d'une réduction de 10 à 50 % du nombre de pharmacies communautaires en Ontario.

*Résultats :* Environ 63,6 % de la population ontarienne réside dans un îlot de diffusion situé à une distance, pouvant se faire à pied, d'une ou plusieurs pharmacies; 84,6 % et 90,7 % de la population réside à des distances de 2 km et 5 km, respectivement. En supprimant de façon aléatoire 30 % des pharmacies communautaires en Ontario, ces chiffres baissent à 56,0 %, 81,4 % et 89,0 %, respectivement pour chaque distance; une réduction de 50 % des pharmacies donne des résultats de 48,3 %, 77,1 % et 87,2 %, respectivement.

*Conclusion :* Les pharmacies sont géographiquement accessibles pour la majorité de la population ontarienne. De plus, il semble que la fermeture d'un petit nombre de pharmacies ait un faible impact sur l'accès géographique. Cependant, les fermetures peuvent avoir d'autres types d'impacts sur l'accès, tels que le coût, les temps d'attente et une réduction de choix pour les patients.

**P**HARMACISTS PROVIDE IMPORTANT HEALTH SERVICES ASSOCIATED WITH MEDICINE dispensing and related counselling. Some provinces have also recently granted pharmacists various prescribing privileges. As the sole location of these services in community settings, the accessibility of community pharmacies may be an important determinant of healthcare access and related quality. This issue has been highlighted in recent debates about generic pricing policies, particularly a new Ontario policy that effectively halved the amount paid for generic drugs. In response, pharmacy chains claimed that lost margins on generics would force them to close stores (Howlett and Strauss 2010). This debate has become national in scope as other provinces also consider changes in their generic drug pricing policies (Howlett and Seguin 2010).

Geographic access has been shown to influence use of many healthcare services, including primary care (Arcury et al. 2005), hospitals (Goodman et al. 1997), cardiac revascularization (Gregory et al. 2000) and emergency rooms (Turnbull et al. 2008; Lowe et al. 2009). Distance to pharmacy services has been less studied (Hiscock et al. 2008). One US study found that distance to pharmacy did not influence medicine use by rural populations (Schectman et al. 2002); however, another study in New Zealand found that patients farther from a pharmacy were less likely to use their services (Hiscock et al. 2008). We are unaware of any prior research in Canada on the geographic accessibility of pharmacy services.

In 2008, there were an estimated 8,223 community pharmacies in Canada (IMS Health Canada 2009a). At that time, Canada had 40% more pharmacies per capita than the United States (IMS Health Canada 2009a; Pharmaceutical Commerce 2009). While this disparity may result from differences in geography and population distribution, the level of access to community pharmacies in Canada deserves further investigation. Although long travel distances might cause prescriptions to go unfilled, an oversupply of pharmacies may result if retail mark-ups on medicines induce more firms to enter the market than are necessary to provide reasonable geographic access (Grootendorst et al. 2008). We therefore studied the current state of geographic access to pharmacies in Ontario and simulated the impact of possible closures.

## Methods

### *Data sources*

We obtained location data for all Ontario pharmacies from the Ontario College of Pharmacists website and removed all hospital, military and veterinary pharmacies using keyword searches and hand screening (Ontario College of Pharmacists 2010). We geo-coded pharmacy locations using pharmacy addresses, verifying street addresses by phone and Internet inquiries wherever a post office box was listed (DMTI Spatial 2008). Using telephone inquiries and street-level photographs from Google Maps, we manually determined the location for any pharmacy our geo-coding software identified without high precision.<sup>1</sup>

We merged these data with road network data from DMTI Spatial (2009) and 2006 census data from Statistics Canada (2007). We used population estimates at the dissemination block level, which are small areas typically bounded by roads. These are the smallest geographic areas for which population figures are available. In 2006, Ontario had 12,160,282 residents in

126,244 blocks, an average of 96.3 (Statistics Canada 2008). We also used Statistics Canada definitions to classify each dissemination block as either urban or rural (Statistics Canada 2008).

*Statistical analysis*

We used network analysis, which calculates the road distance between points (pharmacies) and small areas (blocks). Using the Network Analysis tool in ESRI ArcGIS, we constructed walking (800-m) and driving (2-km and 5-km) service areas for each pharmacy (ESRI 2009). Following a similar process to other studies, for each census block we determined whether it was intersected by each pharmacy’s service area (McGregor et al. 2005; Schuurman et al. 2006).

We calculated the number and proportion of the Ontario population living in census dissemination blocks within each distance of one to five or more pharmacies. Further, we used Monte Carlo simulation to analyze changes in these proportions under different pharmacy closure scenarios. In these simulations, we randomly omitted a percentage of pharmacies (10%, 20%, 30%, 40% and 50%) from the analysis and recalculated the proportions. We used 10,000 iterations to generate means and confidence intervals for the entire province and stratified based on urban and rural classification.

**Results**

From the 3,571 records in the original data set, we identified 3,352 community pharmacies. This total number of community pharmacies is very similar to other published estimates for Ontario (IMS Health Canada 2009b). As shown in Table 1, almost two-thirds (63.6%) of Ontarians live in a census block within walking distance (800 m) of one or more community pharmacies. In terms of driving distances, 84.6% and 90.7% of the Ontario population live in a census block within 2 km and 5 km of at least one community pharmacy, respectively. These proportions varied substantially between urban and rural areas. As shown in Table 2, 73.3% of urban residents reside in a census block within walking distance of a pharmacy, and 96.2% are within 2 km. In contrast, only 40.9% of rural residents live in a dissemination block within 5 km of a pharmacy.

**TABLE 1.** Estimated population (and proportion) living in census dissemination blocks located within walking distance (800 m) and short driving distance (2 km and 5 km) of 1 or more through 5 or more pharmacy locations<sup>2</sup>

Number of Pharmacies	Walking		Driving			
	800 m		2 km		5 km	
	Number	%	Number	%	Number	%
1 or more	7,738,741	63.6	10,288,253	84.6	11,024,318	90.7
2 or more	5,299,770	43.6	9,344,287	76.8	10,487,350	86.2
3 or more	3,603,376	29.6	8,495,017	69.9	10,192,749	83.8
4 or more	2,378,293	19.6	7,507,481	61.7	9,840,298	80.9

TABLE 1. Continued.

	Walking		Driving			
	800 m		2 km		5 km	
	Number	%	Number	%	Number	%
5 or more	1,599,884	13.1	6,593,040	54.2	9,594,944	78.9
Total Population	12,160,282					

TABLE 2. Estimated population (and proportion) living in both urban and rural census dissemination blocks located within walking distance (800 m) and short driving distance (2 km and 5 km) of 1 or more through 5 or more pharmacy locations

**Urban**

Number of Pharmacies	Walking		Driving			
	800 m		2 km		5 km	
	Number	%	Number	%	Number	%
1 or more	7,585,689	73.3	9,961,187	96.2	10,283,876	99.4
2 or more	5,258,622	50.8	9,209,679	89.0	10,029,999	96.9
3 or more	3,588,829	34.7	8,423,621	81.4	9,853,061	95.2
4 or more	2,373,481	22.9	7,470,877	72.2	9,591,387	92.7
5 or more	1,597,607	15.4	6,572,847	63.5	9,396,857	90.8
Total Population	10,351,135					

**Rural**

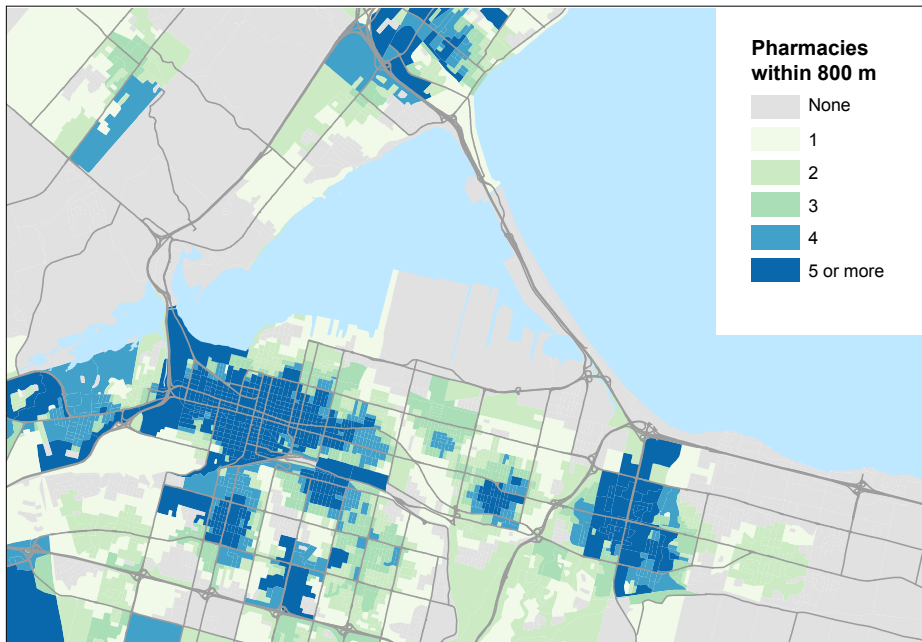
Number of Pharmacies	Walking		Driving			
	800 m		2 km		5 km	
	Number	%	Number	%	Number	%
1 or more	153,052	8.5	327,066	18.1	740,442	40.9
2 or more	41,148	2.3	134,608	7.4	457,351	25.3
3 or more	14,547	0.8	71,396	3.9	339,688	18.8
4 or more	4,812	0.3	36,604	2.0	248,911	13.8
5 or more	2,277	0.1	20,193	1.1	198,087	10.9
Total Population	1,809,147					

Beyond a single pharmacy, 43.6% of the Ontario population live in a census block within walking distance of two or more pharmacies; the similar figures for 2 km and 5 km are 76.8%

and 86.2%, respectively. A notable 54.2% of Ontarians live in census blocks within 2 km, and 78.9% live within 5 km, of five or more community pharmacies.

Community pharmacies are particularly concentrated within urban areas zoned for commercial activity. For example, Figure 1 illustrates the access statistics for census blocks within the city of Hamilton (see Appendix A for other maps). As seen in the figure, significant portions of the city are within walking distance of five or more pharmacies.

**FIGURE 1.** The number of pharmacies within an 800 m road travel distance of census dissemination blocks in Hamilton, Ontario



As illustrated in Table 3, geographic access decreases less than proportionally with the closure of community pharmacies. For example, a random closure of 20% of community pharmacies would reduce the population with walkable access to one or more pharmacies by only 4.6%, from 63.6% to 59.0% (95% CI: 58.4%–59.5%). A random closure of 40% of community pharmacies would reduce it by 11.1%, from 63.6% to 52.5% (95% CI: 51.7%–53.3%). For 2-km driving distances, these reductions are much smaller: from 84.6% to 82.7% (95% CI: 82.3%–83.1%) and 79.6% (95% CI: 78.8%–80.2%). Finally, for 5 km, closing 50% of the pharmacies reduces the rate of geographic access from 90.7% to 87.2% (95% CI: 86.6%–87.8%) – a change of only 3.4%.

Finally, Table 4 shows that random pharmacy closures would have a greater impact on rural dissemination blocks. For example, a random closure of 40% of community pharmacies reduces the urban population within a 5-km driving distance by only 1.5% (from 99.4% to 97.9%). In contrast, this same reduction reduces the number of rural residents within 5 km of a community pharmacy by 4.3% (from 37.5% to 33.2%).

**TABLE 3.** Estimated proportion of Ontario residents living in a 2006 census dissemination block located within walking distance (800 m) and short driving distance (2 km and 5 km) of 1 or more pharmacy locations. We calculated pharmacy reduction scenarios by randomly selecting pharmacies for closure and using identical methods over 10,000 iterations of Monte Carlo simulation.

Pharmacy Reduction	Walking		Driving			
	800 m		2 km		5 km	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
None	63.6%	–	84.6%	–	90.7%	–
10%	61.5	(61.1, 61.9)	83.8	(83.5, 84.0)	90.2	(90.0, 90.4)
20%	59.0	(58.4, 59.5)	82.7	(82.3, 83.1)	89.7	(89.3, 89.9)
30%	56.0	(55.4, 56.7)	81.4	(80.8, 81.9)	89.0	(88.6, 89.4)
40%	52.5	(51.7, 53.3)	79.6	(78.8, 80.2)	88.2	(87.8, 88.7)
50%	48.3	(47.4, 49.1)	77.1	(76.3, 77.9)	87.2	(86.6, 87.8)

**TABLE 4.** Estimated proportion of both rural and urban Ontario residents living in a 2006 census dissemination block located within walking distance (800 m) and short driving distance (2 km and 5 km) of 1 or more pharmacy locations. We calculated pharmacy reduction scenarios by randomly selecting pharmacies for closure and using identical methods over 10,000 iterations of Monte Carlo simulation.

**Urban**

Pharmacy Reduction	Walking		Driving			
	800 m		2 km		5 km	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
None	73.3%	–	96.2%	–	99.4%	–
10%	70.9	(70.4, 71.3)	95.4	(95.1, 95.7)	99.1	(98.9, 99.2)
20%	68.0	(67.4, 68.7)	94.4	(93.9, 94.8)	98.8	(98.5, 99.0)
30%	64.7	(63.9, 65.4)	93.0	(92.4, 93.6)	98.4	(98.0, 98.7)
40%	60.7	(59.8, 61.6)	91.2	(90.4, 91.9)	97.9	(97.4, 98.2)
50%	55.8	(54.8, 56.8)	88.6	(87.6, 89.5)	97.1	(96.6, 97.6)

**Rural**

Pharmacy Reduction	Walking		Driving			
	800 m		2 km		5 km	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
None	8.5%	–	18.1%		40.9%	
10%	7.8	(7.5, 8.1)	17.0	(16.5, 17.4)	39.3	(38.5, 40.0)

TABLE 4. Continued.

Pharmacy Reduction	Walking		Driving			
	800 m		2 km		5 km	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
20%	7.2	(6.7, 7.6)	15.8	(15.1, 16.4)	37.5	(36.5, 38.4)
30%	6.5	(6.0, 6.9)	14.5	(13.8, 15.2)	35.5	(34.2, 36.6)
40%	5.7	(5.2, 6.2)	13.1	(12.3, 13.9)	33.2	(31.8, 34.6)
50%	4.9	(4.4, 5.5)	11.6	(10.7, 12.4)	30.5	(29.1, 32.0)

### Conclusions

Geographic access to pharmacies is important to ensure access to medicines and related professional services. We found that the majority of Ontario residents can access community pharmacies within reasonable travel distances, both walking and driving. Owing to concentrations of competing pharmacies in areas zoned for commercial activity, our simulation results showed that reductions in the number of pharmacies would have only modest effects on geographic access to pharmacies in Ontario. However, it also shows that the effect of closures may be more pronounced on people living in rural areas.

We note several limitations. First, we used only residence as the locus of access, which ignores individual travel patterns. However, this approach would only impart a conservative bias on results because individuals may have pharmacies located near their workplaces or physicians' offices, for example. Second, we used population data from the 2006 census. Owing to recent population growth patterns, however, these data likely understate the current degree of urbanization, and therefore pharmacy accessibility. Using census data also limited our analysis to census blocks and not individual addresses; however, this is the standard method in these types of analyses (Schuurman et al. 2006). Further, the publicly released census data do not contain information on the age, income or sex composition of dissemination areas. However, closures of pharmacies in areas with a high concentration of elderly residents are less likely than closures in other areas because the average per capita retail spending on prescription drugs per elderly Canadian is 4.5 times the average for non-elderly Canadians (Morgan et al. 2008).

Despite our manual checking of locations, our geo-coding procedure may not have been exact for every pharmacy. However, we have no reason to believe this would introduce any systematic bias into our results. We used a uniform probability of pharmacy closure in our Monte Carlo simulations. This approach ignores the fact that pharmacies would likely close in areas with the greatest concentration of competitors per medicine user. These areas may include both low-density rural areas with small patient populations and high-density urban areas with many pharmacies. However, if pharmacy closures did occur in more competitive areas, our estimates would again be conservative. Finally, because our analysis focused only on Ontario, the effect of closures on other provinces may differ. However, Ontario currently has

fewer pharmacies per capita than every other province except Quebec and British Columbia (Ontario's Community Pharmacies 2010).

Our findings are important in the context of recent debates about generic drug pricing and pharmacy reimbursement in Canada. Our results – made under conservative assumptions – indicate that if reductions in the price paid for generic drugs did result in some reduction in the number of pharmacies, there would likely be only a modest impact on geographic access to pharmacies themselves. To address concerns about access to pharmacist services in rural and remote areas, governments should seriously consider implementing mechanisms – such as those in Australia and those in Ontario – that provide additional professional compensation for these pharmacists (Mossialos et al. 2004). In the future, governments should consider whether the other impacts of pharmacy closures due to price reductions, such as choice, cost, wait time and convenience, justify the resources that could be used in other health and social programs.

#### ACKNOWLEDGEMENTS

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#### NOTES

<sup>1</sup> We manually determined the location for any pharmacy DMTI identified with “CanMap street low precision” or worse (GIS Precision Codes 200+), as well as pharmacies identified as using street aliases in their address (GIS Codes 60–70).

<sup>2</sup> Based on these estimates, 36.4%, 15.4% and 9.3% of the population do not currently live in a census dissemination block within 800 m, 2 km and 5 km of a pharmacy, respectively.

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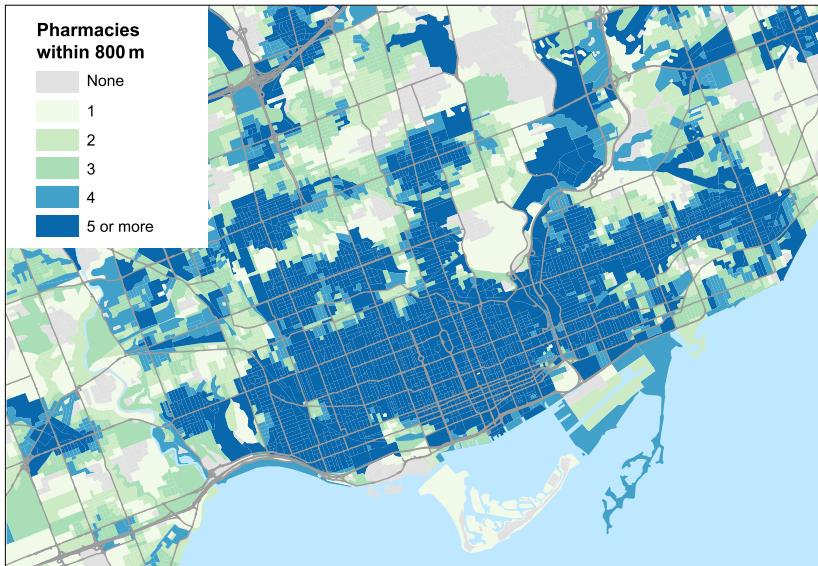


## Geographic Accessibility of Community Pharmacies in Ontario

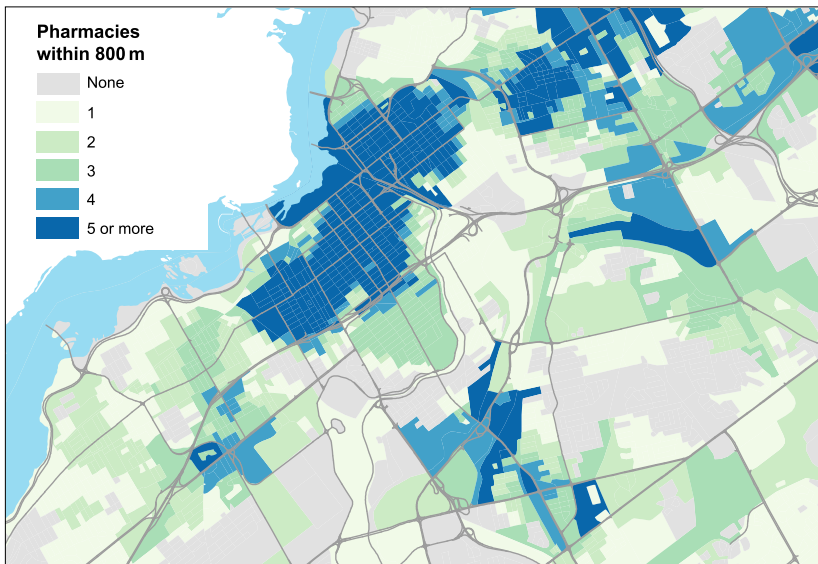
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## Appendix

**FIGURE A1.** The number of pharmacies within an 800 m road travel distance of census dissemination blocks in Toronto, Ontario



**FIGURE A2.** The number of pharmacies within an 800 m road travel distance of census dissemination blocks in Ottawa, Ontario



# Availability of Healthcare Resources, Positive Ratings of the Care Experience and Extent of Service Use: An Unexpected Relationship

Disponibilité des ressources de soins de santé,  
appréciation positive de l'expérience de soins et étendue  
de l'utilisation des services : une relation inattendue



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## Abstract

Two main avenues are advocated to improve the capability of healthcare systems to satisfy the public's needs and expectations: more resources and better organization. This paper sheds some light on this debate. It assesses the extent to which patients' positive rating of their healthcare experience and the extent to which they use services are related to the availability of healthcare resources. Findings indicate that patients' evaluations of their care experience and use of services were higher when the availability of resources was either limited or average. In no case were positive ratings of services and greater use of them associated with greater resource availability. Thus, simply adding resources runs the risk of diminishing, rather than improving, users' healthcare experience.

## Résumé

Deux principales démarches sont favorisées pour l'amélioration de la capacité des systèmes de santé, afin de satisfaire les besoins et les attentes de la clientèle : des ressources accrues et une meilleure organisation. Cet article fait un peu de lumière sur ce débat. Il évalue à quel point l'appréciation positive des soins exprimée par les patients et leur degré d'utilisation des services sont liés à la disponibilité des ressources de soins de santé. Les résultats indiquent que l'évaluation de l'expérience et l'utilisation des services sont plus élevées quand la disponibilité des ressources est limitée ou de niveau moyen. Dans aucun cas, l'appréciation positive et une plus grande utilisation des services sont associées à une plus grande disponibilité de ressources. Ainsi, le simple fait d'injecter des ressources peut conduire au risque de diminuer l'appréciation de l'expérience de l'utilisateur, au lieu de l'améliorer.

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**O**BSERVERS IN MANY COUNTRIES HAVE BEGUN QUESTIONING WHETHER THEIR health systems are able to satisfy the public's needs and expectations (Saltman et al. 1998). Two main approaches have been proposed to resolve these problems (OECD 2004). The first involves providing more resources to health systems, based on the assumption that the problems are due to a lack of resources to deal with an aging population, increasing public expectations and technological developments (Standing Senate Committee 2002). The second approach suggests making better use of the resources already available and targets changes to the organization of health systems and the delivery of services (Romanow 2002). The underlying assumption is that adding resources will have a marginal effect on the problems within these systems if changes have not first been made to the organization of the systems.

This paper attempts to shed some light on this debate. The study was undertaken to determine whether a patient's experience with primary care services and use of services vary with the availability of health resources.

## Data Source

This study consists of a secondary analysis of data from a project funded by the Canadian Health Services Research Foundation (CHSRF). Its methodological components have been detailed elsewhere (Haggerty et al. 2007). This project captured the experience of 3,319 primary care users in five Quebec administrative regions. Respondents came from a random sample of 100 medical clinics stratified by geographical context and clinic type. A total of 221 physicians participated in the study, and the users' sample consisted of approximately 15 patients seen consecutively by each of these physicians.

## Variables and Methods

The users' experience of care was documented through a questionnaire that rated the accessibility, continuity and responsiveness of their primary care services and gathered their self-reported utilization of health services. Fourteen variables (described in Table 1, see <http://www.longwoods.com/content/22178>) were constructed for this study.

*Accessibility* was assessed according to the ease with which patients could contact primary care services given the location of the organizations, their opening hours, physician availability and waiting times for appointments, as well as the ease of patient access to services for emergency or urgent needs (Pineault and Daveluy 1986). There are three types of continuity of care: relational continuity, informational continuity and management continuity (Reid et al. 2002). This study measured *relational continuity* through the existence of a relationship between a patient and a physician or a primary care organization, the length and quality of this relationship and regular recourse to this source of care. *Informational continuity* was assessed by the transfer of information collected during visits with other primary care physicians to the patient's usual source of care. *Management continuity* was measured by the role played by the patient's usual source of care in requests for consultations with medical specialists. *Responsiveness* (WHO 2000) was measured by whether the patient was treated as a person and the importance that physicians gave to patient waiting times. *Service utilization* refers to the services of family physicians, medical specialists and hospital emergency rooms. Users' care experience is presented in more detail in another publication (Lamarche et al. 2010).

Four variables capture the availability of health resources. The variables represent the number of healthcare organizations available within 15 minutes' travelling time from the centre of a municipality where the primary care organizations used by patients were located (Gauthier et al. 2009). The health organizations were (1) primary healthcare organizations, (2) general hospitals offering general medical care, internal medicine and general and orthopaedic surgery, (3) specialized hospitals offering care in several other medical specialties but lacking sophisticated technical equipment and (4) hospitals providing ultra-specialized care; these were generally university hospitals with specialized or even ultra-specialized medical services and an elaborate technical infrastructure.

An index of vulnerability was constructed to capture users' susceptibility to poorer health and, consequently, to a greater need for service utilization. It includes a direct measure of users' health status. It also includes other factors that are likely to have an influence on care

experience and use of services independently of their association with health status. These factors are financial position (poor or very poor), level of education (no high school diploma), employment (other than employed), civil status (single), age (65 years of age or older) and perceived state of health (poor). Users with five or more of these factors (11.6% of users) were considered highly vulnerable. Users with none or one of these factors (11.7% of users) were given a low level of vulnerability. The vulnerability of the rest of the sample was considered average. The index was constructed with the explicit assumption of an increasing influence of users' vulnerability as the number of factors increases.

A logistic regression was performed to analyze the dichotomous variables of the care experience. These variables related to informational continuity, relational continuity and use of services. Ordinal logistic regression was used to analyze the polytomous variables of the care experience (three and four categories) (see Table 1).

## Findings

Tables 2 and 3 present odds ratios (ORs) associating positive ratings of the care experience and reported use of services with the availability of primary healthcare resources and general hospitals (Table 2) as well as with specialized and ultra-specialized hospitals (Table 3). The data indicate that care experience and use of services are influenced by the availability of healthcare resources. The availability of general hospitals is less influential because it affects only components of relational continuity.

Generally, there was a negative gradient between users' ratings of care experience and the availability of healthcare resources. Positive evaluations were more frequent when the resources were least available. Having more resources available nearby reduced the likelihood that users would rate their healthcare experience positively. In general, when these resources were most available, the lowest proportion of users positively evaluated each component of the care experience.

There are exceptions to these patterns. The first exception concerns the availability of ultra-specialized hospitals. For slightly more than half of the components of the care experience, users were most likely to make a positive evaluation when they reported an average availability of these hospitals. This was the case for ease of contact, most aspects associated with relational continuity, informational continuity and one component of responsiveness (being considered a person by the family physician). The other half of these components followed the general pattern, that is, a positive evaluation of the care experience was more likely when there was less availability of these hospitals nearby.

The other exception pertains to the availability of primary care resources. The evaluation of some components of relational continuity was better when the availability of these resources was average. In no instance, however, was a positive evaluation of the care experience associated with greater availability of these health resources nearby.

**TABLE 2.** Association (OR) between a positive rating of the care experience, use of services and availability of primary healthcare resources and general hospitals, controlling for patient vulnerability

Components of Care Experience	Primary Care				General Hospitals		Reference Category
	Low		Average		Low		High
	OR	95% CI	OR	95% CI	OR	95% CI	OR
<b>Accessibility</b>							
Ease of contact	1.8	1.7–1.9	1.2	1.01–1.4	1.0	0.9–1.1	1.0
Urgent needs	1.3	1.2–1.4	1.1	0.9–1.3	1.1	0.9–1.2	1.0
<b>Continuity</b>							
<i>Relational Continuity</i>							
Affiliation with an MD/time	1.8	1.6–1.9	2.2	2.0–2.5	1.2	1.1–1.4	1.0
Affiliation with a clinic/time	1.5	1.4–1.7	1.6	1.4–1.8	1.2	1.01–1.3	1.0
Regular use of MD's services	1.4	1.3–1.8	1.5	1.3–1.7	0.9	0.7–0.99	1.0
MD's knowledge of the patient	1.8	1.6–1.9	1.4	1.3–1.6	1.0	0.9–1.1	1.0
Quality of communication	1.7	1.6–1.9	1.5	1.3–1.7	1.1	0.9–1.2	1.0
<i>Management continuity</i>	2.0	1.8–2.1	1.1	0.9–1.3	1.0	0.8–1.1	1.0
<i>Informational continuity</i>							
With MDs – primary care	1.9	1.6–2.2	1.0	0.7–1.4	0.9	0.7–1.2	1.0
<b>Responsiveness</b>							
Respect for the individual	1.5	1.3–1.6	1.4	1.2–1.0	1.1	0.9–1.2	1.0
Importance of waiting time	1.7	1.5–1.8	0.9	0.6–1.0	0.9	0.8–0.99	1.0
<b>Utilization</b>							
Number of primary care consultations	1.3	1.1–1.4	1.2	0.9–1.4	1.1	0.9–1.2	1.0
Number of specialists consulted	0.9	0.7–1.1	1.1	0.8–1.4	1.1	0.8–1.2	1.0
Use of emergency services	1.8	1.4–2.5	1.0	0.8–1.2	1.0	0.9–1.2	1.0

Availability of Healthcare Resources, Positive Ratings of the Care Experience and Extent of Service Use: An Unexpected Relationship

**TABLE 3.** Association (OR) between a positive rating of the care experience, use of services and availability of specialized and ultra-specialized hospitals, controlling for patient vulnerability

Components of Care Experience	Specialized Hospitals				Ultra-specialized Hospitals				Reference Category
	Low		Average		Low		Average		High
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR
<b>Accessibility</b>									
Ease of contact	1.8	1.6–1.9	1.3	1.2–1.5	1.7	1.5–1.8	1.7	1.5–2.0	1.0
Urgent needs	1.3	1.2–1.5	1.1	0.9–1.3	1.3	1.2–1.5	1.0	0.8–1.3	1.0
<b>Continuity</b>									
<i>Relational Continuity</i>									
Affiliation with an MD/ time	1.8	1.6–1.9	1.8	1.7–2.0	1.9	1.8–2.1	2.6	2.4–2.9	1.0
Affiliation with a clinic/ time	1.7	1.6–1.9	1.3	1.1–1.5	1.7	1.5–1.8	2.1	1.9–2.4	1.0
Regular use of MD's services	1.6	1.4–1.7	1.5	1.3–1.6	1.4	1.2–1.5	1.9	1.7–2.1	1.0
MD's knowledge of the patient	2.0	1.8–2.1	1.8	1.6–1.9	1.8	1.6–1.9	2.2	2.0–2.5	1.0
Quality of communication	1.9	1.7–2.1	1.5	1.3–1.6	1.7	1.6–1.9	1.7	1.4–1.9	1.0
<i>Management continuity</i>	2.0	1.8–2.2	1.4	1.2–1.6	1.7	1.5–1.9	1.6	1.2–1.9	1.0
<i>Informational continuity</i>									
With MDs – primary care	2.0	1.7–2.3	1.5	1.2–1.8	1.7	1.4–1.9	2.1	1.6–2.7	1.0
<b>Responsiveness</b>									
Respect for the individual	1.7	1.5–1.9	1.6	1.4–1.8	1.6	1.4–1.7	2.1	1.8–2.4	1.0
Importance of waiting time	1.5	1.3–1.6	1.1	0.9–1.2	1.5	1.4–1.7	1.1	0.8–1.3	1.0
<b>Utilization</b>									
Number of primary care consultations	1.3	1.1–1.4	1.2	1.1–1.4	1.2	1.0–1.3	1.0	0.7–1.2	1.0
Number of specialists consulted	0.9	0.6–1.1	1.0	0.7–1.3	0.9	0.7–1.2	1.4	1.0–1.8	1.0
Use of emergency services	1.7	1.3–2.5	1.3	1.0–1.7	1.7	1.3–2.0	1.0	0.7–1.3	1.0



A similar but weaker association exists between the use of services and the availability of health resources. The association was generally negative. The use of services was more frequent when resources were least available. Having more resources available nearby reduced the likelihood of using services. When resources were most available, use of services was reported by the lowest proportion of users. This general pattern was found for the availability of primary care resources and specialized hospitals on the one hand and the use of primary care consultations and emergency services on the other hand. The nearby availability of general hospitals did not influence the use of any type of services. The use of medical specialists was related only to the availability of ultra-specialized hospitals. Their use was more frequent when the availability of these hospitals was average. But in no instance was the use of services associated with greater availability of these health resources nearby.

## **Discussion and Conclusion**

This study found that positive evaluations of the care experience were more commonly made by users of primary care services in municipalities where the availability of health facilities was rated low or average. This association was observed for almost all the components of the care experience as well as for most of the health resources analyzed. This study also revealed that a positive perception of the care experience was less common among users of primary care service organizations with the greatest availability of nearby health resources. This association was also observed for almost all the components of the care experience. Similar but weaker associations were found regarding the use of services.

These results could not be explained by differences in users' characteristics. The reported associations held after controlling for the level of vulnerability of users. Vulnerability did influence the rating of the care experience as well as use of services, but did not modify significantly the effect of availability of healthcare resources. Different expectations of people living in areas with various levels of availability of resources are not likely, either, to account for these results. Residents of rural settings attached greater value to different components of the care experience than their counterparts in urban centres (Gauthier et al. 2009). However, no significant difference was found on the level of expectations between rural and urban residents. If a difference exists, it is that rural residents may have higher expectations than urban residents, not the reverse (Haggerty et al. 2008).

This study re-emphasizes the significance of characteristics of the healthcare system in patients' positive evaluation of their care experience and their extent of service use (Andersen and Newman 1973). To our knowledge, this study is the first to compare the care experience of users in municipalities with varying availability of healthcare facilities nearby. Contrary to popular belief, greater availability of healthcare resources is associated with less rather than greater use of services and less positive evaluation of the care experience.

Similar results have been observed in studies comparing the performance of healthcare systems and the amount of resources at their disposal. These studies compared healthcare systems of several developed countries (Davis et al. 2007), including Australia, Canada and European countries (Health Consumer Powerhouse EB and Frontier Centre 2008) and of

Canadian provinces (Lamarche et al. 2007). None of these studies showed a positive relationship between the performance of the systems, including components of users' care experience, and the resources available. At best, they showed no relationship.

There are at least four possible explanations for these results. The first concerns the responsibility of care providers. It is plausible that care providers practising in municipalities with fewer resources feel more personally responsible for patients in their community. These organizations are keenly aware that if they do not fully assume their responsibilities, negative consequences may ensue for the community. The situation appears to be very different for service providers practising in municipalities with more health resources. For example, family physicians in rural and remote areas were much less likely than those in urban centres to close their practices. Conversely, family physicians were more likely to close their practices when they perceived their communities to have good emergency department services and when other physicians in the community also had closed their practices (Woodward and Pong 2006). Other evidence supports this explanation (Geneau 2004).

The second explanation concerns the organization of primary care services. In one of our studies, we observed that the organization of primary care services differs according to the availability of health resources (Lamarche et al. 2009b). In municipalities with few nearby health resources, primary care organizations are generally associated with satisfying care experiences. Conversely, in municipalities with more health resources, primary care organizations are generally associated with less satisfying care experiences.

The third explanation lies in the nature of these organizations' environments. Organizations operating in municipalities with fewer nearby health resources are generally located in rural areas, farther from large urban centres. One might conclude that these contextual characteristics explain as much, if not more, of our observations than merely the availability of nearby resources. Some of our observations support this explanation (Lamarche et al. 2009c).

The fourth explanation concerns the nature of the relationships among healthcare resources. One of the factors associated with users' favourable experiences of care is the integration of services within municipalities (Lamarche et al. 2002). This integration appears to be more difficult to achieve, and thus is less common, in areas with more nearby resources.

One of the major consequences of our findings is that without a better understanding of the influence of the availability of resources on the behaviour of service providers and on the integration of their activities, adding resources runs the risk of reducing rather than increasing the number of users who will be satisfied with their care experience and who will use services.

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## Availability of Healthcare Resources, Positive Ratings of the Care Experience and Extent of Service Use: An Unexpected Relationship

**TABLE 1.** Operational definitions of variables

Variables	Question Items and Response Categories	Coding Categories
<b>Organizational Accessibility</b>		
Ease of contact	Ease of contacting the clinic associated with 1 – Location, 2 – Office hours, 3 – Clinic availability, 4 – Physician availability and 5 – Waiting times for an appointment: Excellent, Very good, Good, Average, Poor or Very poor	Number of Excellent and Very good: Very positive = 5; Positive = 4; Less positive = 2 & 3; Least positive = 0 & 1
Ease of contact in an emergency / urgent needs	When sick or in immediate need, ease of: 1 – seeing someone the same day when the clinic is open; 2 – seeing or talking to someone in the clinic at night; 3 – seeing or talking to someone in the clinic during weekends; 4 – A telephone number you can dial to talk to someone Absolutely yes, Probably yes, Probably not, Absolutely not	Number of Absolutely and Probably yes: Very positive = 4; Positive = 3; Less positive = 1 & 2; Least positive = 0
<b>Continuity</b>		
<i>Relational continuity</i>		
Affiliation with an MD	Years of affiliation: Number	Positive = $\geq 2$ years; Less positive = $< 2$ years
Affiliation with clinic	Years of affiliation: Number	Positive = $\geq 2$ years; Less positive = $< 2$ years
Regular use of care services	Consultation with your physician for: 1 – a general health exam; 2 – a new health problem; 3 – a health question; 4 – You see the same physician whenever you visit the clinic Absolutely yes, Probably yes, Probably not, Absolutely not	Number of Absolutely yes replies: Very positive = 3 & 4; Positive = 2; Less positive = 1; Least positive = 0
MD's knowledge of the patient	Your physician knows: 1 – you as a person; 2 – with whom you live; 3 – your most important problems; 4 – your complete medical history; 5 – your occupation; 6 – your difficulty in obtaining or paying for your drugs; 7 – the drugs you are taking Absolutely yes, Probably yes, Probably not, Absolutely not	Number of Absolutely yes replies: Very positive = 6 & 7; Positive = 4 & 5; Less positive = 2 & 3; Least positive = 0 & 1
Quality of MD–patient communication	Your physician would: 1 – call you to give the results of your tests; 2 – meet members of your family if necessary; 3 – let you look at your medical record Absolutely yes, Probably yes, Probably not, Absolutely not	Number of Absolutely yes replies: Very positive = 3; Positive = 2; Less positive = 1; Least positive = 0
<i>Management continuity</i>		
Role of clinic and physician in consultations with specialists	Your physician: 1 – refers you to the specialist; 2 – knows that you consulted the specialist; 3 – helps in obtaining an appointment; 4 – explains the reason of the reference to the specialist; 5 – knows the results of the consultation; 6 – explains these results to you Absolutely yes, Probably yes, Probably not, Absolutely not	Number of Absolutely yes replies: Very positive = 6; Positive = 4 & 5; Less positive = 2 & 3; Least positive = 0 & 1
<i>Informational continuity</i>	Your physician is informed about a visit you made to another family physician Absolutely yes, Probably yes, Probably not, Absolutely not	Positive = Absolutely and Probably yes Less positive = Otherwise

TABLE 1. Continued.

Variables	Question Items and Response Categories	Coding Categories
<b>Responsiveness</b>		
Respect for the individual	Your physician: 1 – replies to questions in a way you understand; 2 – gives you time to talk about your problems and sorrows; Are you: 3 – at ease talking about your problems and sorrows; 4 – confident that your physician understands what you say and ask? Yes, Probably yes, Probably not, No	Number of yes replies: Very positive = 4; Positive = 3; Less positive = 2; Least positive = 0 & 1
Importance of waiting time	Appreciation of the waiting time at the clinic before seeing your physician Excellent, Very good, Good, Average, Poor, Very poor	Very positive = Excellent; Positive = Very good; Less positive = Good; Least positive = Otherwise
<b>Service Utilization</b>		
PHC MDs	Visits in the last year: Number	More $\geq$ 5 visits; Less = $\leq$ 5
Medical specialists	Different medical specialists consulted in the last 2 years: Number	Number of specialists consulted: More = $\geq$ 1; Less = 0
Emergency departments	Number of visits to a hospital Emergency Department in the last year: Number	More = $\geq$ 1 visit; Less = 0 visit

# Prioritizing Information for Quality Improvement Using Resident Assessment Instrument Data: Experiences in One Canadian Province

Prioriser l'information pour l'amélioration de  
la qualité au moyen des données provenant d'un système  
d'information sur les services à domicile :  
expérience d'une province canadienne



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## Abstract

**Purpose:** To elicit priority rankings of indicators of quality of care among providers and decision-makers in continuing care in Alberta, Canada.

**Methods:** We used modified nominal group technique to elicit priorities and criteria for prioritization among the quality indicators and resident/client assessment protocols developed by the interRAI consortium for use in long-term care and home care.

**Results:** The top-ranked items from the long-term care assessment data were pressure ulcers, pain and incontinence. The top-ranked items from the home care data were pain, falls and proportion of clients at high risk for residential placement. Participants considered a variety of issues in deciding how to rank the indicators.

**Implications:** This work reflects the beginning of a process to better understand how providers and policy makers can work together to assess priorities for quality improvement within continuing care.

## Résumé

**Objet :** Favoriser le classement des indicateurs de la qualité des soins chez les fournisseurs et les décideurs dans le contexte des soins prolongés en Alberta, au Canada.

**Méthodologie :** Nous avons employé une technique de groupe nominal modifiée pour favoriser la priorisation et définir les critères pour les indicateurs de la qualité et les protocoles d'évaluation des clients/résidents développés par le consortium interRAI pour les soins prolongés et les soins à domicile.

**Résultats :** Les items situés aux premiers rangs selon les données sur l'évaluation des soins prolongés sont les escarres de décubitus, la douleur et l'incontinence. Les items situés aux premiers rangs selon les données pour les soins à domicile sont la douleur, les chutes et le nombre de clients présentant un haut risque de placement en résidence. Les participants ont tenu compte de plusieurs enjeux dans leur décision pour le classement des indicateurs.

**Répercussions :** Ce travail est le point de départ d'un processus pour mieux comprendre comment les fournisseurs et les responsables de politiques peuvent travailler ensemble à l'évaluation des priorités visant l'amélioration de la qualité dans le contexte des soins prolongés.



**I**NCONSISTENCIES IN QUALITY AMONG CONTINUING CARE FACILITIES MAY BE RESPONSIBLE for the variation in resident outcomes that exists across these settings (Rantz et al. 1996). To address such inconsistencies, many jurisdictions have mandated use of the Resident Assessment Instruments (RAI) to standardize care practice data and enable comparisons across facilities (Rantz et al. 1996). The RAI instruments facilitate routine, standardized assessment and documentation of resident characteristics (Rantz et al. 1996, 1997; Hirdes et al. 1999, 2004; Frijters et al. 2001), and several instruments have been developed for use in continuing care (i.e., home care, assisted living and long-term care facility living) (Alberta Health and Wellness 2008). In Canada, the Canadian Institute for Health Information (CIHI) has

adopted the RAI 2.0 as the Canadian standard for use in long-term care (LTC) and the RAI Home Care instrument (RAI-HC) in home care (Carpenter et al. 1999, 2000; Frijters et al. 2001; Hirdes et al. 2001; Berta et al. 2006). The RAI-HC and the RAI 2.0 share some items, but the content of each is relevant to the populations cared for in each setting.

## Quality of Care

The purposes of the RAI tools include standardizing resident assessment and forming an evidence base to influence clinical practice and policy decisions (interRAI 2006). To meet this mandate, the interRAI group has developed a number of tools using RAI data to improve quality of care. These tools include individual resident or client assessment protocols (RAPs for LTC, CAPs for HC) and unit- and facility-level quality indicators (QIs).

### *Assessment protocols*

These are standardized protocols linked to care plans for commonly encountered problems in LTC and HC settings. Their purpose is to guide care planning for an individual resident or client. Assessment protocols are triggered by specific data entered into a RAI assessment. For example, the RAP for falls prevention is triggered by a LTC facility resident having fallen within the past 90 to 180 days and other information included in RAI 2.0. The RAI 2.0 consists of 18 RAPs (Morris et al. 2005), and the RAI-HC contains 30 CAPs (Morris et al. 2002). A major update released in late 2008 changed the naming convention for the assessment protocols to a standard “Client Assessment Protocol” across all continuing care settings. We use the older terminology because our study was conducted before this change was implemented.

### *Quality indicators*

These are derived from RAI data aggregated to the facility level. They represent the proportion of residents with a given condition (Zimmerman et al. 1995; Zimmerman 2003; Hirdes et al. 2004; Dalby et al. 2005). The QIs provide information about how an organization could focus its attention to provide higher quality of care (Rantz 1995; Ryther 1995). Awareness of problem areas can lead to quality improvement activities, improved care processes and better resident outcomes, as well as influence policy decisions and strategic planning (Rantz et al. 1997, 2004; Zimmerman 2003). There are different versions of QIs in use across jurisdictions. We used the versions approved by CIHI (Hirdes et al. 2001; Center for Health Systems Research and Analysis 2006). Twenty-five QIs are used in LTC and 30 in HC settings.

The RAPs and CAPs focus on different service settings – LTC versus HC, respectively – and provide individually focused recommendations for improving care. In contrast, the purpose of the QIs is to influence facility-wide quality improvement activities by highlighting areas in which a facility may be performing poorly. For both the QIs and CAPs/RAPs, there are areas of overlap between HC and LTC and areas distinct to each setting. For example, the RAI 2.0 and RAI-HC have QIs for falls and pain, whereas only the RAI-HC has a QI for influenza vaccination (Hirdes et al. 2001; Center for Health Systems Research and Analysis 2006).

Implementation of the RAI 2.0 and RAI-HC occurred in Alberta between 2004 and



2008. During this time, Continuing Care Standards were promulgated by Alberta Health and Wellness as part of an initiative to support high-quality continuing care (Alberta Health and Wellness 2008). As a result, quality of care has been a central concern of decision-makers and policy makers in the province.

### Impetus for Prioritization

The primary motivation and funding for this project came from the Knowledge Brokering Group (KBG), a group of researchers and decision-makers in Alberta who obtained funding from the Canadian Health Services Research Foundation and the Alberta Heritage Foundation for Medical Research to establish a demonstration project linking LTC and HC decision-makers and researchers. The main focus of the KBG project was on promoting use of the RAI data through extensive education and interaction with researchers.

Despite their different purposes, the QIs and the CAPs/RAPs both represent information that clinicians and managers obtain from RAI assessments. While these tools are intended to facilitate decision-making, KBG participants and other continuing care decision-makers had identified the large number of possible quality issues generated by these instruments as a concern for decision- and policy makers in Alberta. Without prioritizing information from the RAI data, decision-makers and clinicians find it difficult to select areas in which to focus their quality improvement efforts. Previous research has shown that providing undifferentiated QI data to staff does not always improve care (Popejoy et al. 2000; Rantz et al. 2001), and that facility staff may be able to focus on only one or two areas of quality improvement at a time (Rantz et al. 2001). One approach to dealing with this issue of perceived information overload is to develop a priority-based structure for information from RAI tools, permitting decision-makers and clinicians to select high-priority areas aligned to their strategic plans.

While competing priorities will likely always exist among clinicians, health organization managers and policy makers, developing a priority-based structure for the RAI information may help to focus and align quality improvement efforts across different sectors within continuing care by highlighting those areas most likely to have the greatest effect on resident outcomes.

More broadly, there have been calls for multi-criteria approaches to priority setting in healthcare in which evidence-based resources, economics and equity are all considered (Baltussen and Niessen 2006; Urquhart et al. 2008). Key aspects of priority setting include a systematic, open and explicit process in which research evidence, maximization of benefit, minimization of cost, equity and efficiency are all considered (Mitton and Donaldson 2003). One component of a multifaceted approach is to include multiple voices in the prioritization process.

To begin to address this expressed need for prioritization, we elicited stakeholder views about priorities for quality improvement and safety. As a secondary objective, we elicited their criteria for rating priorities. We were unable to find any description of priority-setting criteria for quality improvement in continuing care in the literature, nor were KBG members aware of criteria used in the field. The project was deemed exempt from ethics review by the Health Research Ethics Board at the University of Alberta.

## Methods

We used a modified nominal group technique to elicit and rank provider priorities and criteria among the QIs and CAPs/RAPs. Although there are differences between the QIs and CAPs/RAPs, both were included for prioritization because of the widespread perception of significant overlap between the two, and the concern that they may be perceived as competing for attention by staff within facilities.

### Participants

Our focus was to understand provider priorities from the perspective of regional representatives. Regional RAI implementation leaders from the former nine regional health authorities in Alberta were sent a letter describing the project (the health system in Alberta has since reorganized into a single authority). The regional representatives were asked to nominate at least one owner–operator, one facility manager and one front-line staff person from LTC facilities and HC agencies in their region. We received varying numbers of nominees from eight of the nine regions, with no response from the ninth region (the former Northern Lights region in the north of the province). Project staff invited all nominees to participate in a meeting close to their region.

One of the eight responding regions was unable to participate owing to staffing issues at the time of the meeting. This left a total of 47 people representing seven of the nine health regions to participate in the four meetings, summarized in Table 1. While the former regions differed in whether they were rural, urban or a mix of both, there are no systematic differences that we are aware of, although the former Chinook and Aspen regions went further than other regions in adapting the RAI data to create reports and tools. Representatives from both regions were active participants in the regional and final meetings.

**TABLE 1.** Summary of meeting participants

		Calgary N=10	Red Deer N=5	Edmonton N=14*	Final Meeting N=28**
No. of males		2	1	2	7
Level of representation	Regional	5	5	10	14
	Organizational	5	0	4	11
	Researchers	0	0	0	3
Practice setting	Rural	0	2	8	4
	Urban	8	0	6	20
	Mixed	2	3		4
Type of continuing care	Long-term care	7	5	9	Unknown
	Home care	3	1	5	Unknown

\* Six people participated via teleconference.

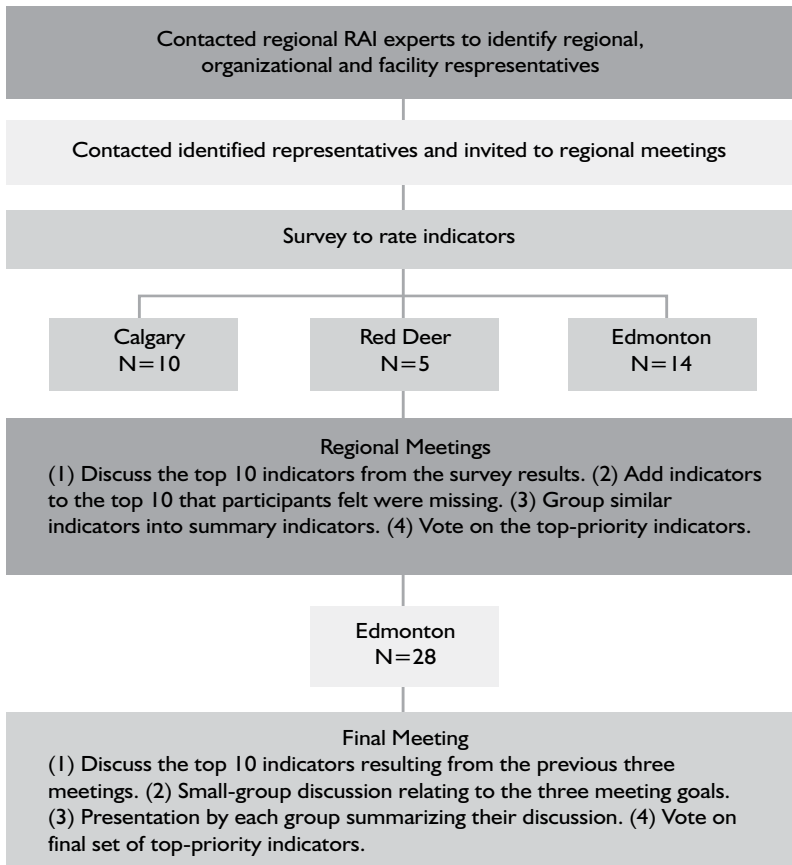
\*\* Included a mix of participants from the previous meetings as well as new participants from the regions and the KBG.

The participants were either in management roles at their respective facilities or worked directly for the regional health authority. Participants specialized in HC or LTC, but were knowledgeable about the full continuing care spectrum and the use of RAI tools at the organizational level. Participants reflected the mix of health professionals providing continuing care services, and included nurses, occupational therapists, physical therapists, dietitians and one physician. The majority of the meeting participants had experience as front-line care providers but were no longer in those roles.

*Meeting process*

Four meetings took place in Alberta between February and May 2008. Three regional meetings were held (Calgary, Red Deer and Edmonton), followed by one final meeting of all the regions, held in Edmonton in conjunction with the Canadian InterRAI National Meeting. We used the same process for each regional meeting. We provide a graphic representation of the process used to organize the regional meetings in Figure 1.

FIGURE 1. Meeting process



## Prioritizing Information for Quality Improvement Using Resident Assessment Instrument Data: Experiences in One Canadian Province

Two weeks prior to the meeting, participants were sent two questionnaires, one for the RAI 2.0 25 QIs/18 RAPs and one for the RAI-HC 22 QIs/30 CAPs. These listed the CIHI-approved QIs and the CAPs/RAPS and asked participants to rate each item on a scale where 1 was “not important” and 7 “very important” for quality improvement purposes. All participants were asked to consider aggregated data (e.g., for a unit or HC case worker/office) as their reference. These questionnaires were sent back to the research team in advance of the meeting, and average ratings for each item were calculated.

We began each meeting by listing the top 10 rated priorities based on the item averages from the questionnaires. We then held a facilitated discussion among all participants at a meeting with three goals:

1. To determine whether participants felt that items not included in the top 10 rated priorities should be included.
2. To elicit a richer description of the importance of the participant-selected indicators (e.g., what makes pain a high priority?).
3. To elicit the criteria underlying indicator priority rating more generally (e.g., what criteria did you use in determining indicator priorities?).

The QIs and CAPs/RAPs were treated as equivalent for the purpose of these discussions.

At each meeting, one author (AS) facilitated the discussions and another (KD) took notes and tallied votes. CJM participated as a facilitator at the first regional meeting. The purpose of the discussion was to come to agreement when there were areas of disagreement. There was no requirement to achieve complete consensus. During the discussion, participants acknowledged that some of the indicators addressed similar concepts. These items were then grouped together and became the summary items displayed in Table 2. Participants were also given the opportunity to discuss indicators that they felt were important but did not make the top 10 and add them to the list of priority indicators. Discussions lasted between three and four hours and were complete when all participants agreed that they had voiced their opinions. After discussion, we asked all participants to vote for their top priorities from the summary indicators that were created and added during the discussion. Each participant could cast three votes. The project staff did not vote. We audio-recorded the three regional meetings. We did not transcribe the audiotapes, but took field notes during the meetings and checked these against the audio recordings to ensure that we captured major themes that emerged in the discussion. The discussions cycled through the three goals of the meeting iteratively rather than linearly.

The fourth and final meeting was held in Edmonton on May 30, 2008. All previous meeting participants as well as KBG project members were invited to participate. We circulated the preliminary report summarizing the study and initial results prior to the meeting and asked participants unable to attend the final meeting to send their input via e-mail. We received no additional feedback via e-mail.

**TABLE 2.** Final priority-rated summary indicators for the RAI-MDS 2.0 and RAI-HC

LTC Indicator (RAI 2.0 QIs/RAPs)	Votes	HC Indicator (RAI-HC QIs/CAPs)	Votes
Pressure ulcers	16	Pain	12
Pain	15	Falls	10
Incontinence	8	Institutional placement	8
Falls	7	Brittle informal support	4
Little or no activity	7	Less social activity/Social isolation	4
Uses antianxiety, antipsychotic, hypnotic	5	Exhibits distressing behaviour	3
Behavioural symptoms	5	Medications	3
Dehydration	4	Malnutrition	3
Depression symptoms without antidepressants	4	Unmet need	2
Physically restrained	3	Disease management	2
Malnutrition	3	Bladder incontinence	2
Delirium	1	Depression/Anxiety	2
Polypharmacy	1	Delirium	2
Oral health	1	Hospitalization	1
Disease management	1	Pressure ulcers	1
		Changes in ADL	1
		Hazardous environment	1

Twenty-eight people attended the meeting. The format was similar to the previous meetings with a few exceptions. After the discussion of the prioritized items, the participants were broken into small groups and asked to discuss the three goals from the previous meetings and summarize their thoughts for the larger group. Participants voted for their top priorities among those that had been listed initially as well as those that were added after the group discussion. Each participant received three votes.

Finally, we assembled summary tables with notes describing the discussions and sent these out to participants from all four meetings, with requests for feedback.

## Results

### Rankings

Table 2 lists the summary indicators ranked according to number of votes received at the final meeting. The RAI items grouped to form the summary items are listed in Appendices A and B. The top-rated indicators in LTC coming from RAI 2.0 data were pressure ulcers, pain,

incontinence, falls and little or no activity among residents. In HC, the top-rated indicators were pain, falls, institutional placement, brittle informal support systems and decreased social activity/social isolation. In the discussions resulting in these ratings, participants in all meetings expressed concern about areas of overlap between indicators, as well as perceived interrelationships among the indicators that they felt reflected a complex reality, making identification of important single indicators in isolation difficult. For example, the interrelationships among pain, nutritional intake or nutritional status and falls were discussed at some length in two of the three meetings. Pain can decrease appetite and food intake, leading to weakness and other symptoms such as dizziness, which can greatly increase risk of falls. Many participants voiced concern that because these complex causal pathways could not be easily disentangled, focusing on pain might be more important as a root cause of other problems (also indicators of care needs or poor quality) that are equally important but may result from a problem reflected in the pain indicator.

### *Criteria*

We asked participants to identify their criteria for priority setting at all four meetings. A number of criteria related to the potential impact of the indicator including (a) the ability to create change, (b) the potential implications of critical incidents related to the item, (c) perceived indicator effectiveness, (d) indicator potential to optimize care and (e) indicator utility to clients/caregivers rather than to policy makers or the media.

Other criteria related to desirable indicator traits included (a) stability, (b) dependency of the indicator on other indicators (the complex interrelationship referred to above), (c) indicator ability to represent the “big picture” of the client’s status and (d) indicator relationship to the Continuing Care Standards promulgated by the provincial ministry.

Other criteria included (a) occurrence of the indicator across settings – if issues exist in both LTC and HC, they were considered more important; (b) impact on resource use, feasibility and barriers to using the indicator; (c) public perception of the indicator; (d) sentinel events; (e) safety; (f) autonomy and preference; (g) client well-being; and (h) value in risk adjustment. One concern about including the CAPs/RAPs in the discussion was that they are not risk adjusted. When using the indicators, participants felt that people need to be clear about which ones have been risk adjusted and which have not.

## Discussion

### *Indicator groupings*

At each meeting, there was considerable discussion about overlap among items, particularly across the QIs and CAPs/RAPs, but also within each set. Participants articulated an urgent need to further assess the overlap among these items, and that once overlap is reduced, the number of possible indicators for focus will be significantly decreased. This discussion was not focused primarily on issues of redundancy, but more about the clinical relationships among QIs and CAPs/RAPs.

Participants agreed that there are clear relationships between different items or indicators. For example, items such as medication use, dehydration, poor nutrition and so on may influence falls. Placing high priority on falls risk and prevention may require that equal priority be placed on precursor indicators. There was consensus that creating a conceptual map among indicators might assist with setting priorities, allowing organizations and care providers to utilize an indicator, such as falls, as a “high-level” indicator and assess the “causal” indicators to determine plans of action.

In part, this consensus may reflect the reality that the QIs, as well as the CAPs/RAPs, have been developed iteratively over time as the instruments and their use have evolved. The QIs come from different initiatives and projects, with different methods and purposes (Zimmerman et al. 1995; Berg et al. 2002; Zimmerman 2003). As a result, there is no overarching conceptual map for these indicators, and the same is true of the CAPs/RAPs. In general, they are found useful in facilities and among continuing care organizations, but they do not embody a high level of purpose-driven planning. We believe that it may be possible to use existing data to explore the conceptual underpinnings of these important tools, to rationalize them and make them more useful for the field.

These challenges provide the basis for future research examining the relationships between the QIs and CAPs/RAPs. In this work, we will assess models of indicator relationships beginning with a comprehensive review of the literature for each indicator area. Then, we will use secondary analysis of a large, Canadian RAI 2.0 data set to test the model structures to determine whether the literature-based theories are reflected in the current RAI 2.0 data. In a final step, we will use decision-maker and clinician input to explore the utility of these indicator models to provide users with information that assists them in planning their quality improvement activities. Our initial plans focus on RAI 2.0 data, but a similar process is needed for RAI-HC. To our knowledge, QIs have not yet been finalized for all of the newer instruments developed by the interRAI consortium.

We hypothesize that illustrating the QI interrelationships may assist decision-makers, clinicians and policy makers to focus on those indicator areas that come earlier in the causal hierarchy. Affecting quality areas early in the causal chain may then improve the related QI areas, improving efficiency of quality improvement efforts.

### *Challenges*

Participants discussed some of the challenges that they face within the continuing care sector. They found keeping up with the priorities set by the regions challenging, and were concerned that the current system does not capture the medical complexity within facilities. Providers are involved in multiple roles; facilities and agencies have fewer resources and take on more complicated clients. The QIs do not depict the day-to-day reality inside the facilities and the daily challenges encountered by staff. This finding gives rise to concern because of the possibility that facilities will one day be rewarded or penalized for their QI scores. In the United States, some QIs are already publicly reported. There are important considerations that Canadian jurisdictions should take into account as they discuss similar approaches (Hutchinson et al. 2009).

Participants also discussed the need to integrate the continuing care system across the different care streams – that is, HC, supportive living, LTC – at least through common data elements (Frijters et al. 2001). Currently, the regions and facilities are using different software and have access to different tools, reports and resources. A standardized reporting system would facilitate transfers and data comparisons across facilities and regions.

Because only the RAI 2.0 and RAI-HC instruments are mandated in Alberta, the RAI-HC is used in supportive living settings as well as in HC. Meeting participants voiced concern that the RAI-HC does not capture some critical elements that influence care planning for clients in supportive living settings, a distinct group between HC clients and LTC facility clients on the spectrum of care need.

Participants discussed additional elements they would like to see included in the tools. The RAI-HC and RAI 2.0 indicators do not capture “resident and family choice.” Whether they should or not is certainly a matter for debate. The continuing care standards in Alberta incorporate negotiation, preferences and resident choices as core elements (Alberta Health and Wellness 2008). These choices do not always reflect “best” care processes and may result in worse QI scores despite the fact that staff are respecting the residents’ or families’ wishes. Other components that participants felt were missing from the tool include (a) no RAI-HC QI for risk of facility placement, (b) no QI or RAP for hearing and (c) no assessment in the RAI-HC of level of formal support needed versus what is available.

Some of the issues raised about what may not be included in the RAI tools have been addressed in newer instrument versions. However, it is important to note that the focus of the RAI tools, other than QIs, remains on care planning for the individual client, and not resource allocation decisions based on what is available in the environment. Planning for resource allocation requires information outside the scope of the RAI instruments. In addition, there will always be competition for resource allocation and competing priorities, which cannot be reconciled through any single process. However, a more cohesive and collaborative approach to defining priorities, and discussing the varying criteria and their weighting in setting priorities, may help provide a more equitable and transparent process for determining where to focus attention.

### *Limitations*

This was a brief, time-limited project designed to obtain feedback from a variety of experts across the province. We succeeded in getting participation from representatives in seven of the nine regions, across a wide range of provider types. Although many participants had prior experience as direct care providers in continuing care, we had only one participating physician and no current front-line providers. We concur with statements made by several participants that both physicians and current front-line provider opinions would extend and deepen the priorities identified. The views of residents and family members would also be of value, although these lie outside the scope of the present project.



## Summary

We wish to acknowledge the years of research by the interRAI consortium towards development of current indicators and care protocols and hope that this report is informative to the groups who continue this complex work into the future. This report reflects the beginning of processes to deepen our understanding of how providers and policy makers can work together to assess and act upon priorities. The goal of this project was to elicit the voices of stakeholders who provide care to people in need of continuing care services to assess priorities among indicators of quality of care. The meeting participants are responsible for improving quality of care in continuing care settings in Alberta. While their opinions will not, and probably should not, dictate how priorities are set at regional or provincial levels, they contribute important insights to the prioritization discussion. Future research on the interrelationships among the indicators of problems in care processes might inform future iterations of QI development.

## ACKNOWLEDGEMENTS

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**APPENDIX A.** RAI 2.0 Summary Indicator Composition

Summary Indicator	Grouped Indicators
Pressure ulcers	Proportion (a) at risk for developing pressure ulcers; (b) with pressure ulcers
Pain	Proportion with pain
Incontinence	Proportion (a) with an incontinence care plan; (b) bladder/bowel incontinent; (c) occasionally bladder/bowel incontinent without a toileting program
Falls	Proportion (a) at risk for falls; (b) who have had falls
Little or no activity	Proportion (a) where inactivity may be a complication; (b) with little or no activity
Uses antianxiety, antipsychotic or hypnotic drugs	Proportion (a) receiving antianxiety or hypnotics; (b) receiving antipsychotics; (c) who received hypnotics more than twice in the last week
Exhibits behavioural symptoms	Proportion (a) with behavioural symptoms; (b) with behavioural symptoms affecting others
Dehydration	Proportion that are dehydrated
Depression symptoms without antidepressants	Proportion who have symptoms of depression without antidepressant therapy
Physically restrained	Proportion that are being physically restrained
Malnutrition	Proportion who have a malnutrition problem
Delirium	Proportion who have delirium
Polypharmacy	Proportion who receive nine or more different medications
Oral health	Proportion with dental care or oral health problems
Disease management	Disease management

**APPENDIX B.** RAI HC Summary Indicator Composition

Summary Indicator	Grouped Indicators
Pain	Proportion (a) who have pain that limits their ability to function; (b) who have disruptive or intense daily pain; (c) with inadequate pain control
Falls	Proportion (a) who have had a recent fall or who are at risk of falling; (b) who have had a fall
Institutional placement	Proportion at high risk of residential facility placement in the next three months
Brittle informal support	Proportion with brittle informal support system
Less social activity/social isolation	Proportion who are alone for long periods of time/always and report feeling lonely or are distressed by declining social activity
Exhibit distressing behaviour	Proportion who exhibit distressing behaviours

**Prioritizing Information for Quality Improvement Using Resident Assessment Instrument Data:  
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<b>Summary Indicator</b>	<b>Grouped Indicators</b>
Medications	Proportion (a) having problems with medication management; (b) taking psychotropic drugs and require a medication review or would benefit from more/different medication monitoring; (c) whose medications have not been reviewed by a physician within the last 180 days
Malnutrition	Proportion who are malnourished or have an increased risk of developing nutritional problems
Unmet need	Proportion with unmet need
Disease management	Disease management
Bladder incontinence	Proportion (a) with urinary incontinence and/or have an indwelling catheter; (b) with failure to improve/incidence of bladder incontinence
Depression/Anxiety	Proportion who suffer from depression or anxiety
Delirium	Proportion with delirium
Hospitalization	Proportion who have been hospitalized, visited emergency departments or received emergent care
Pressure ulcers	Proportion (a) with pressure ulcers or at risk of developing pressure ulcers; (b) with failure to improve/incidence of skin ulcers
Changes in ADL	Proportion with failure to improve/incidence of decline in activities of daily living long form
Hazardous environment	Proportion whose environmental conditions are hazardous



## Predictors of Home Care Expenditures and Death at Home for Cancer Patients in an Integrated Comprehensive Palliative Home Care Pilot Program

Facteurs de prévision des dépenses pour les soins à domicile et les décès à domicile chez les patients atteints du cancer dans le cadre d'un programme pilote de soins palliatifs complets à domicile

DORIS M. HOWELL, TOM ABERNATHY, RHONDA COCKERILL, KEVIN BRAZIL, FRANK WAGNER AND LARRY LIBRACH

### Abstract

**Purpose:** Empirical understanding of predictors for home care service use and death at home is important for healthcare planning. Few studies have examined these predictors in the context of the publicly funded Canadian home care system. This study examined predictors for home care use and home death in the context of a “gold standard” comprehensive palliative home care program pilot in Ontario where patients had equal access to home care services.

**Methods:** Secondary clinical and administrative data sources were linked using a unique identifier to examine multivariate factors (predisposing, enabling, need) on total home care expenditures and home death for a cohort of cancer patients enrolled in the HPCNet pilot.

**Results:** Subjects with gastrointestinal symptoms (OR: 1.64;  $p=0.03$ ) and those with higher income had increased odds of dying at home (OR: 1.14;  $p<0.001$ ), whereas age, number of GP visits, gastrointestinal symptoms (i.e., nausea, vomiting, bowel obstruction) and eating problems (i.e., anorexia/cachexia) predicted home care expenditures.

**Conclusions:** Predictors of home death found in earlier studies appeared less important in this comprehensive palliative home care pilot. An income effect for home death observed in this study requires examination in future controlled studies.

**Relevance:** Access to palliative home care that is adequately resourced and organized to address the multiple domains of issues that patients/families experience at the end of life has the potential to enable home death and shift care appropriately from limited acute care resources.

### Résumé

**Objet :** La compréhension empirique des facteurs de prédiction pour l'utilisation des services à domicile et pour les décès à domicile est importante pour la planification des services de santé. Peu d'études se sont penchées sur ces facteurs de prédiction dans le contexte des systèmes publiques de soins à domicile au Canada. Cette étude examine les facteurs de prédiction pour l'utilisation des soins à domicile et pour les décès à domicile dans le contexte d'un programme pilote « exemplaire » de soins palliatifs complets à domicile, en Ontario, dans lequel les patients ont un accès égal aux services de soins à domicile.

**Méthodologie :** Des sources de données secondaires cliniques et administratives ont été couplées entre elles au moyen d'un identificateur unique d'étudier les facteurs multivariés (predisposant, habilitant et nécessaire) des dépenses totales pour les soins à domicile et pour

les décès à domicile, et ce pour une cohorte de patients atteints du cancer et inscrits dans un programme pilote du HPCNet.

**Résultats :** Les sujets qui présentent des symptômes gastrointestinaux (RC: 1,64;  $p=0,03$ ) et ceux qui ont un revenu plus élevé sont plus susceptibles de décéder à la maison (RC: 1,14;  $p<0,001$ ) tandis que l'âge, le nombre de visites de l'omnipraticien, les symptômes gastrointestinaux (c.-à-d., la nausée, les vomissements, l'occlusion intestinale) et les troubles de l'alimentation (c.-à-d., anorexie/cachexie) permettent de prévoir les dépenses pour les soins à domicile.

**Conclusions :** Les facteurs de prédiction pour les décès à domicile, dégagés par les études antérieures, semblent moins importants que ceux qu'on observe dans le cadre de ce projet pilote de soins palliatifs complets à domicile. L'effet du revenu sur les décès à domicile, observé dans cette étude, devrait faire l'objet d'éventuelles études contrôlées.

**Pertinence :** Un accès aux soins palliatifs à domicile pourvu des ressources et de l'organisation appropriées, et tenant compte des multiples enjeux qu'expérimentent les patients (et leurs familles) à la fin de la vie, pourrait faciliter les décès à domicile et permettre une réorientation adéquate des soins qui allégerait le secteur des soins de courte durée dont les ressources sont limitées.

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ONLINE EXCLUSIVE



### Changes in Physiotherapy Utilization in One Workforce: Implications for Accessibility among Canadian Working-Age Adults

Changements dans l'utilisation des services de physiothérapie par la population active : répercussions sur l'accessibilité pour les adultes canadiens en âge de travailler

SHEILAH HOGG-JOHNSON, DONALD C. COLE, HYUNMI LEE, DORCAS E. BEATON, CAROL KENNEDY, PETER SUBRATA AND THE WORKPLACE UPPER EXTREMITY RESEARCH GROUP

#### Abstract

In debates over access to essential medical care, comparatively little attention has been paid to the provision of outpatient physiotherapy services. We examined physiotherapy utilization for musculoskeletal disorders (MSDs) among approximately 2,000 employees of a large, unionized, Ontario workplace. We obtained MSD-related physiotherapy claims and service data from the public Workplace Safety and Insurance Board, two private medical insurance carriers, a workplace special fund starting in 1995 and a workplace-contracted, on-site physiotherapy clinic starting in 1999. We observed substantial increases in overall physiotherapy utilization for MSDs: a median of 234 services per quarter for 1992–1994 to 1,281 for 1999–2002.

With enlightened workplace provision policies, most physiotherapy utilization occurred on-site by 1999–2002 (70%). With a user-pay orientation to outpatient physiotherapy services increasing among working-age adults in Ontario, there is substantial potential for unequal access among those not privately insured or in workplaces with direct service provision.

## Résumé

Dans les débats sur l'accès aux soins de santé essentiels, on porte comparativement peu d'attention à la prestation de services de physiothérapie pour les patients externes. Nous avons étudié l'utilisation de services de physiothérapie pour les troubles musculosquelettiques (TMS) chez environ 2000 employés d'un grand milieu de travail syndiqué, en Ontario. Nous avons consulté les données sur les services et les réclamations relatives aux soins de physiothérapie provenant d'un organisme public – la Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail – et de deux sociétés privées d'assurance médicale, soit un fonds spécial en milieu de travail qui existe depuis 1995 et une clinique de physiothérapie sur les lieux de travail qui existe depuis 1999. Nous avons observé une augmentation substantielle de l'utilisation générale des services de physiothérapie pour les TMS : une médiane de 234 services par trimestre pour la période 1992-1994 et de 1281 services pour la période 1999-2002. Avec des politiques éclairées de prestation de services en milieu de travail, la majeure partie de l'utilisation des services de physiothérapie a eu lieu sur place pour la période 1999-2002 (70 %). Avec l'accroissement des politiques d'utilisateur-payeur pour les services externes de physiothérapie chez les adultes ontariens en âge de travailler, il existe un véritable potentiel d'inégalité d'accès chez ceux qui n'ont pas d'assurance privée ou qui ne bénéficient pas de prestation de services directs en milieu de travail.

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# Revue Pratiques et Organisation des Soins

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# Predictors of Home Care Expenditures and Death at Home for Cancer Patients in an Integrated Comprehensive Palliative Home Care Pilot Program

Facteurs de prévision des dépenses pour les soins à  
domicile et les décès à domicile chez les patients atteints  
du cancer dans le cadre d'un programme pilote de soins  
palliatifs complets à domicile



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## Abstract

**Purpose:** Empirical understanding of predictors for home care service use and death at home is important for healthcare planning. Few studies have examined these predictors in the context of the publicly funded Canadian home care system. This study examined predictors for home care use and home death in the context of a “gold standard” comprehensive palliative home care program pilot in Ontario where patients had equal access to home care services.

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**Results:** Subjects with gastrointestinal symptoms (OR: 1.64;  $p=0.03$ ) and those with higher income had increased odds of dying at home (OR: 1.14;  $p<0.001$ ), whereas age, number of GP visits, gastrointestinal symptoms (i.e., nausea, vomiting, bowel obstruction) and eating problems (i.e., anorexia/cachexia) predicted home care expenditures.

**Conclusions:** Predictors of home death found in earlier studies appeared less important in this comprehensive palliative home care pilot. An income effect for home death observed in this study requires examination in future controlled studies.

**Relevance:** Access to palliative home care that is adequately resourced and organized to address the multiple domains of issues that patients/families experience at the end of life has the potential to enable home death and shift care appropriately from limited acute care resources.

## Résumé

**Objet :** La compréhension empirique des facteurs de prédiction pour l'utilisation des services à domicile et pour les décès à domicile est importante pour la planification des services de santé. Peu d'études se sont penchées sur ces facteurs de prédiction dans le contexte des systèmes publics de soins à domicile au Canada. Cette étude examine les facteurs de prédiction pour l'utilisation des soins à domicile et pour les décès à domicile dans le contexte d'un programme pilote « exemplaire » de soins palliatifs complets à domicile, en Ontario, dans lequel les patients ont un accès égal aux services de soins à domicile.

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**Résultats :** Les sujets qui présentent des symptômes gastrointestinaux (RC: 1,64;  $p=0,03$ ) et ceux qui ont un revenu plus élevé sont plus susceptibles de décéder à la maison (RC: 1,14;  $p<0,001$ ) tandis que l'âge, le nombre de visites de l'omnipraticien, les symptômes gastrointestinaux (c.-à-d., la nausée, les vomissements, l'occlusion intestinale) et les troubles de l'alimentation (c.-à-d., anorexie/cachexie) permettent de prévoir les dépenses pour les soins à domicile.

**Conclusions :** Les facteurs de prédiction pour les décès à domicile, dégagés par les études antérieures, semblent moins importants que ceux qu'on observe dans le cadre de ce projet

Predictors of Home Care Expenditures and Death at Home for Cancer Patients  
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pilote de soins palliatifs complets à domicile. L'effet du revenu sur les décès à domicile, observé dans cette étude, devrait faire l'objet d'éventuelles études contrôlées.

**Pertinence :** Un accès aux soins palliatifs à domicile pourvu des ressources et de l'organisation appropriées, et tenant compte des multiples enjeux qu'expérimentent les patients (et leurs familles) à la fin de la vie, pourrait faciliter les décès à domicile et permettre une réorientation adéquate des soins qui allégerait le secteur des soins de courte durée dont les ressources sont limitées.

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CARE AT HOME IN THE FINAL WEEKS OF LIFE AND AN ADEQUATELY SUPPORTED HOME death is a goal expressed by most patients with a terminal illness (Higginson and Sen-Gupta 2000; Teirnan et al. 2002; Townsend et al. 1990). It is also a health system policy imperative (Romanow 2000). Studies in the United States and internationally show that realization of this goal depends on diverse demographic and disease factors as well as access to tertiary acute care and community hospital beds (Gallo et al. 2001; Greer et al. 1986; Hearn and Higginson 1998; McWhinney et al. 1995; Polissar et al. 1987; Pritchard et al. 1998; Thorne et al. 1994). These factors may become less relevant as predictors of home death if end-of-life (EOL) patients have equal access to high-quality care that meets the "gold standard" for palliative home care.

Gold standard programs are based on standards and norms of practice for palliative care; they include components considered essential for home care at the end of life, including case management/care coordination and access to skilled palliative medicine physicians, knowledgeable and skilled providers (palliative care nurses, personal support workers), psycho-social counselling and respite care (Ferris et al. 2002; CHPCA 2006). The adequacy of home care providers in addressing multi-system disease management and symptom problems as well as multiple domains of EOL needs – including psychological, social, loss/grief, practical and end-of-life preparation – is critical to high-quality palliative care and enabling home death (Ferris et al. 2002; Coyle et al. 1999; Emanuel et al. 1999; Fainsinger et al. 2000; Thorpe 1993). International studies show that access to specialized palliative care programs or hospice team programs and skilled home care case management or care coordination increases the number of days spent at home and rates of home death (Gallo et al. 2001; Beck-Friis and Strang 1993; Constantini et al. 1993; Hughes et al. 1992; Jordhoy et al. 2000; Pannuti 1988; Peruselli et al. 1997; Smeenk et al. 1998).

This paper reports the findings of a descriptive, secondary data linkage study that examined the pattern of home care use (service visits) and the influence of population characteristics inclusive of predisposing, enabling and need factors, based on Anderson's Behavioural Model of Health Services Utilization (Anderson and Newman 1973), as predictors of home care expenditures and home death for cancer patients enrolled in a gold standard comprehensive and integrated palliative home care program. Empirical understanding of home care use and home death predictors in the context of the publicly funded Canadian home care system, when EOL

patients have equal access to gold standard comprehensive palliative home care, could inform healthcare planning and resource allocation decisions. Healthcare services used in these models of care delivery may represent true resource needs for EOL populations because service allocation decisions are tailored to needs as determined by palliative care specialists. Such specialists have clinical expertise that enables them to anticipate needs, especially when they work collaboratively with home care case managers responsible for allocating home care services.

## Methods

Over a two-year period, a pilot demonstration project, the Hospice Palliative Care Network (HPCNet), was conducted in the Greater Toronto Area, a large metropolitan city in the province of Ontario. The HPCNet pilot developed an integrated service delivery model that included a partnership between discrete organizations, including five hospice volunteer agencies, a palliative medicine consultation service and a publicly funded home care program (community care access centre, or CCAC). The CCAC was responsible for allocating services of contracted providers – including visiting nurses, personal support workers (PSWs), dietitians, physiotherapists and occupational therapists – and funding equipment allocations (beds, pain pumps, assistive devices for ADL).

Generic CCAC services were enhanced by the HPCNet pilot with the addition of a comprehensive interdisciplinary palliative care team comprising palliative medicine physicians, palliative consultant nurses, psycho-social counsellors and designated CCAC palliative home care case managers/care coordinators who also integrated hospice volunteer care provision. A rapid-response team was accessible 24 hours a day, seven days a week; palliative consultant nurses provided first call, with back-up assistance from on-call palliative medicine specialists as needed. The team also coordinated early referral to alternative care settings, such as palliative care beds in hospital or chronic care facilities, and worked collaboratively with primary care physicians to determine the appropriate level of support required, depending on the complexity of patient/family issues and available formal and informal resources to provide home-based care. The CCAC centrally coordinated service delivery and provided case management services to achieve seamless integration among partner agencies and interdisciplinary palliative care team members for eligible clients. Integration was achieved through a shared governance structure and a collaborative network team care delivery process. Team composition was tailored to the identified needs of patients and their families and the availability of formal and informal resources. Ongoing weekly team meetings and shared care planning facilitated care coordination and continuity. The team was supported by a clinical database accessible on Web-based PalmPilot platforms in real time with updates as they occurred around the clock (e.g., prescription changes).

Following ethics approval, an inception cohort of patients, all of whom had a life-threatening cancer diagnosis and a referral to the regional home care program, was screened for eligibility. Consenting patients were enrolled in HPCNet if eligibility criteria were met during the pilot's two-year time frame. Eligibility was based on best practice criteria to ensure identification of palliative patients early in the EOL trajectory (Lynn et al. 1996) as follows:

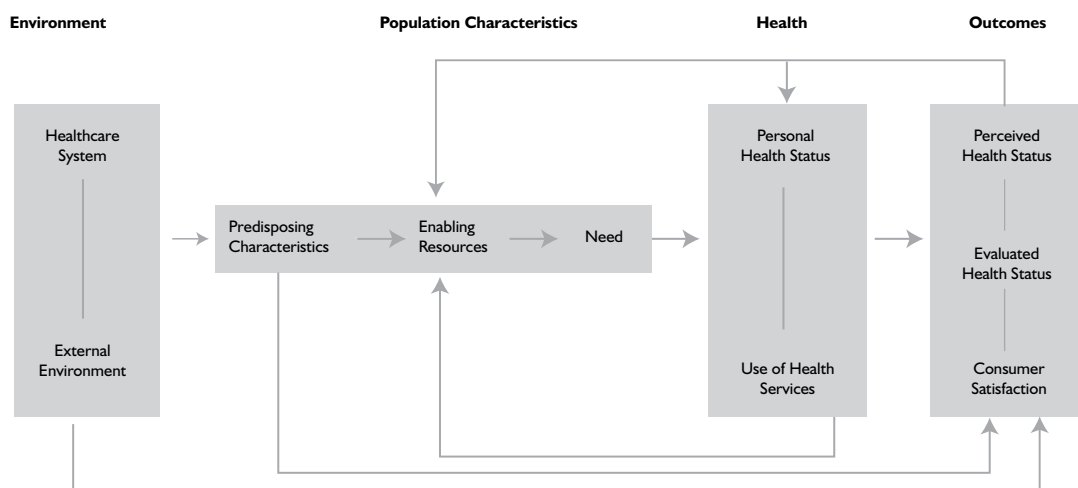
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(1) advanced progressive disease, expectation of death in the next 12 months and (2) unmet symptom management and/or inadequate supportive care. Case finding was initiated within the CCAC to ensure that all patients with advanced, life-threatening illnesses were enrolled in the HPCNet pilot program.

### *Conceptual framework*

The variables included as determinants in this study were based on a commonly used health-care utilization model. According to Anderson's Behavioural Model of Health Services Utilization (Anderson and Newman 1973), three categories of population characteristics act as determinants of healthcare use, including (1) *predisposing*: demographics, social structure and belief systems; (2) *enabling*: family economic resources and location of residence; and (3) *perception of need for services*: either individually, socially or clinically evaluated. Based on available secondary data sources, these variables were operationalized for purposes of this study as follows: (1) *predisposing*: age, gender, education, living status (alone or with someone); (2) *enabling*: family income and family physician visits; and (3) *need*: clinically determined as type of cancer, presence and counts of symptoms and co-morbidities. More recent iterations of this model (Anderson 1995; see Figure 1) added feedback loops, suggesting a reciprocal relationship between outcomes and health that influences population characteristics, but did not specify theoretical propositions ranking some population characteristics as more important than others (Muramatsu and Campbell 2002). Based on empirical literature regarding recommended order entry of variables (Coulton and Frost 1982; Wolinsky 1978; Kempen and Suurmeijer 1991) and literature on factors predictive of home death, we hypothesized that predisposing variables would explain more of the variance in outcomes of home care expenditures and home death. Our rationale was that need variables would no longer act as drivers for service use in this gold standard model of comprehensive palliative home care, given that all patients had equal access to best care practices by HPCNet palliative specialists.

**FIGURE 1.** Conceptual framework of factors associated with health services utilization



Source: Anderson 1995.

### *Sample*

For the purposes of identifying a cancer cohort for this study (a substudy of the full program evaluation) and to ensure a complete case file of CCAC services used for each final episode of home care prior to death, an additional set of eligibility criteria were applied as follows: (1) a diagnosis of cancer and (2) both an HPCNet/CCAC enrolment date and date of death during the 13-month pilot evaluation observation time frame.

### *Data sources*

Multiple database sources were linked using a unique identifier to create a complete individual-level case file for this cancer cohort that included these variables: (1) *Patient-related characteristics* (age, living circumstances, diagnosis, symptoms, co-morbidities, place of death) were derived from the HPCNet clinical database that was developed specifically for the HPCNet pilot. Clinical illness characteristics, including ICD-9 codes for type of cancer, symptoms and co-morbidities (recorded by the clinical team for each individual patient at program entry), were grouped according to body systems and symptoms and coded as present or not present, and as a total symptom count. (2) *Home care services* (length of stay in home care program, visits/hours of care, expenditures) were captured in the CCAC administrative home care service database. (3) *Family physician home visits* from the Ontario Hospital Insurance Plan (OHIP) were extracted using billing codes for home visits. (4) *Median household income* was derived through postal code mapping to Canadian census enumeration data, an approach that is considered reliable and valid for estimating income when other sources of information are not available (Krieger 1992).

### *Pattern of home care service use and outcomes*

The pattern of home care use was described as the number of total visits separately for visiting nurses, PSWs (healthcare aides), primary care physicians, multidisciplinary providers (occupational therapy, physiotherapy, social work), laboratory services and equipment. Outcomes examined included (1) *home care expenditures*: calculated as actual total billing charges per client, based on services used during total length of stay (LOS) in home care program from date of enrolment in the pilot until death (entire home care episode) and (2) *home death*: dichotomized as home or institutional death (hospital, palliative care hospital unit, long-term care).

### *Data analysis*

All analyses were conducted using the SPSS 9 data management program (SPSS for Windows 2005). Skewed home care distributions were transformed, and log-transformed values (log 10) were used in data analysis (Norman and Streiner 2000). Data were summarized using descriptive statistics (means, medians, ranges and standard deviations). Correlation tests appropriate to data type were used to examine relationships between population characteristic variables and outcome variables. Entry of variables in multivariate hierarchical regression was based on empirical literature that interpreted Anderson's model and suggested that variables of need should be entered first in the model (block 1), followed by enabling variables (block

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2) and, finally, predisposing variables (block 3) (Coulton and Frost 1982; Wolinsky 1978; Kempen and Suurmeijer 1991). This entry order was followed to examine the additional variance explained by each set of variables on outcomes when need is initially controlled, as well as the final contribution of predisposing variables. Prior to entry in multivariate models, an initial parsimonious block model of illness characteristics (symptoms, cancer type, co-morbidities) was derived to reduce the number of independent symptom and illness variables in order to maintain adequate statistical power as recommended for multivariate analysis (Norusis 2000). Tolerance levels were examined to rule out multi-collinearity in final models, and residuals were checked to rule out violations of linearity and leverage as measured by Cook's distance (Norusis 2000).

## Results

### *Participant characteristics*

Of the total HPCNet case files for the 13-month evaluation timeframe (n=807), 791 had a cancer diagnosis (other diagnoses not included were end-stage heart failure, chronic obstructive lung disease and other degenerative neuromuscular diseases). Of the 791 cancer patients enrolled during the 13-month period, 604 had a death date recorded during the study observation year. Of these 604 patients, 420 had both a death date and a home care service/HPCNet enrolment date in the observation year and were considered eligible for this cancer cohort study. Excluded patients did not differ on important demographic or other characteristics from those included. Two of the 420 case files were excluded owing to date entry errors, to achieve a final cancer cohort of 418 unique subject case files.

Characteristics of the cancer cohort are summarized in Tables 1 and 2. The majority of the sample comprised an almost equal number of males and females, primarily older and married, with average income and high school education, and a diagnosis of lung cancer. Symptoms were diverse; nausea, vomiting and anorexia were the most prevalent, followed by generalized symptoms, fatigue and dyspnoea.

TABLE 1. Characteristics of the sample (n=418)<sup>a</sup>

Characteristic	n	%
<b>Age</b> (years): mean = 68.64; standard deviation (SD) = 12.91		
<49	56	8.6
50–59	53	12.7
60–69	110	26.3
>70	219	52.4



TABLE 1. Continued.

Characteristic	n	%
<b>Gender</b>		
Male	217	51.9
<b>Marital Status</b> (n=365)		
Married	260	71.2
Single/Widowed/Divorced	105	28.8
<b>Living Status</b> (n=400)		
With someone	319	79.8
<b>Education</b> (n=182)		
College/University	52	28.6
High school	78	42.9
Less than high school	52	28.6
<b>Household Income</b> (\$/year, n=413) mean=59,755, median=53,426, SD=30,794		
<30,000	16	3.9
30,000–49,999	189	45.8
50,000–69,999	98	23.7
70,000–89,999	51	12.3
>90,000	59	14.3
<b>Type of Cancer</b> (n=418)		
Lung	112	26.8
Colorectal/Gastrointestinal	83	19.8
Breast	39	9.3
Genitourinary	32	7.7
Other sites (skin, thyroid)	31	7.4
Haematological	24	5.7
Prostate	23	5.5
Head and neck	23	5.5
Unknown primary	21	5.0
Pancreas	19	4.5
Brain	11	2.6

<sup>a</sup>n=sample size/frequency

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TABLE 2. Recorded symptoms and co-morbidities for the sample (n=374)<sup>ab</sup>

Characteristics of Symptom Experience	n	%
<b>Symptoms</b>		
Gastrointestinal (nausea/vomiting, bowel obstruction)	141	33.7
Generalized symptoms	114	27.3
Fatigue/Weakness	109	26.1
Respiratory (e.g., dyspnoea)	107	25.6
Eating problems/Nutrition (e.g., anorexia/cachexia)	89	21.3
Ascites/Edema	51	12.2
Pain	50	12.0
Cardiovascular	41	9.8
Genitourinary (e.g., incontinence)	39	9.3
Neurological	36	8.6
Psychological (anxiety, depression)	34	8.1
Haematological	29	6.9
Other symptoms	29	6.9
Jaundice	23	5.5
Skin (wounds, ulcers)	21	5.0
Musculoskeletal	12	2.9
<b>Co-morbidities</b>		
Cardiovascular	66	15.8
Endocrine	38	9.1
Respiratory (asthma, chronic obstructive pulmonary disease)	33	7.9
Musculoskeletal	20	4.8
Cerebrovascular	17	4.1
Psychological	10	2.4
Senses (sight, hearing)	15	3.6
<b>Symptom Counts</b>		
<b>Presence of Symptoms</b>		
0	18	4.3
1–2	165	39.5
3–4	135	32.3
>4	56	13.4

TABLE 2. Continued.

Characteristics of Symptom Experience	n	%
<b>Presence of Co-morbidities</b>		
0	239	57.2
1–2	117	28.0
>2	18	4.3

<sup>a</sup> n=sample size/frequency

<sup>b</sup> Some of the cases had more than one symptom and co-morbidity in more than one body system.

Length of stay in the home care program for the sample ranged from three to 310 days, with a mean LOS of 62.43 days (median, 42 days). Most of the sample had a final episode of home care of about two months, with the breakdown of the LOS in days as follows: less than 30 days (36.4%), 31–60 days (27.3%) and 61–90 days (15.8%). A very small percentage (6.7%) required home care longer than six months.

#### *Pattern of home care use*

Pattern and type of home care services used and total expenditures by the sample are described in Table 3. Most patients received nursing visits (93.8%), with a total of 11,224 visits recorded for the entire cohort – lower than the total number of homemaking visits (31,907). The cohort received a total of 1,817 physician home visits with a mean of 4.35 visits per patient (unadjusted for LOS) for a total estimated expenditure of \$200,356. Total expenditures for the cancer cohort was \$1,354,677.83 for the final episode of home care from program enrolment to either death or hospitalization, excluding expenditures for palliative consultant nurses and designated case managers. Visits by general practitioners (GPs; primary care physicians) could not be separated between the patients' GPs and the palliative medicine specialists because the billing categories are the same; palliative medicine is not a designated specialty in Canada. However, the clinical team noted that GP visits were primarily made by the HPCNet palliative medicine specialists. Average daily expenditures for palliative home care services, excluding physician visits and palliative team service enhancements (consultant nurses and designated CCAC case managers) and based on a mean LOS of 62 days, was \$52 per day.

Associations between each type of home care service used and predisposing, enabling and need variables were correlated according to data type. Only significant associations ( $p < 0.05$ ) and the pattern of associations are reported here.

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TABLE 3. Home care service type

Service Type	% Receiving	Total Visits	Mean Visits	Median Visits	SD	Min	Max	Total Expenditures (\$)
Skilled nursing	93.8	11,224	26.85	13.00	39.97	00	321	447,851.50
Homemaking	72.7	31,907	76.34	19.50	162.98	00	1,321	555,886.71
Physician	82.2	1,817	4.35	3.00	5.30	00	49	200,356.02
Multidisciplinary	19.6	423	1.01	0.00	4.01	00	57	28,427.20
Supplies <sup>a</sup>	52.0	N/A	231.27	18.26	719.85	00	10,282	96,669.00
Equipment <sup>a</sup>	77.8	N/A	518.67	108.35	1,224.70	00	12,284	216,804.00
Lab <sup>a</sup>	27.0	N/A	21.63	0.00	60.49	00	44	9,040.00
Total home care expenditure			3,240.86	1,455.09	5,223.22	15	40,497	1,354,677.83
Total home care expenditures for sample (excludes specialist team) <sup>b</sup>								1,354,677.83

<sup>a</sup>Supplies, equipment and lab are expenditures only and are not captured as visits.

<sup>b</sup>"Total home care expenditure" excludes specialist team coordinators and nurses.

### *Nursing*

A negative correlation was associated with number of nursing visits and household income. As income increased, the number of nursing visits decreased. Those who died at home had higher numbers of visits (17.7 visits) compared to those who died in an institution (12.4 visits).

More nursing visits were also associated with the presence of gastrointestinal (GI) symptoms (17.8 vs. 13.4 visits), whereas fewer nursing visits correlated with presence of cerebrovascular co-morbidities (7.6 vs. 15.4 visits).

### *Personal support*

An increased number of PSW visits were associated with greater age, cancer type and home death. Patients who died at home had 51.4 PSW visits compared to 30.9 visits for those dying in institutions. Subjects with brain cancer (mean, 162.2) and those with head and neck cancer (mean, 70.8) used more PSW visits than participants with lung cancer (mean, 38.9), bowel/rectal cancer (mean, 33.9), breast cancer (mean, 51.9), genitourinary cancer (mean, 43.7) and haematological cancer (mean, 22.4). Presence of neurological symptoms was also associated with increased PSW visits (69.2 visits vs. 38 visits).

### *Physician use*

Primary care physician (PCP) visits were positively associated with marital status, presence of co-morbidities (cerebrovascular, musculoskeletal) and GI symptoms (nausea and vomiting). Married subjects used more PCP visits (23.4) compared to non-married subjects (12.6 visits).

Patients with GI symptoms used 26.4 physician home visits compared to those without this symptom (16.6 visits). Fewer GP visits were associated with cerebrovascular (5.8 vs. 20.9 visits) and musculoskeletal co-morbidities (7.2 vs. 20.9 visits).

*Medical supplies and equipment*

Higher mean equipment expenditures were noted for those living with someone (\$234 vs. \$115) and lower for those with ascites (\$117 vs. \$214) or musculoskeletal co-morbidities (\$71 vs. \$214). Higher expenditures were noted for those who died at home (\$282 vs. \$126). Those with musculoskeletal co-morbidities had lower total home care expenditures (\$73 vs. \$191).

*Patterns for place of death*

The majority of the sample died in a location other than an acute care hospital (70.8%). About half of the patients died at home (50.5%), and the remainder died in a palliative care unit (15.8%) or nursing home (3.8%). An equal number of males (48.4%) and females (52.7%) died at home. In bivariate analysis, living with someone ( $p < 0.05$ ), higher income above 90,000 ( $p < 0.01$ ), gastrointestinal symptoms ( $p < 0.01$ ), were associated with home death.

*Predictors for home care expenditure*

Results of the multivariate analysis for total home care expenditures are summarized in Table 4. Illness characteristics (cancer type, symptoms, co-morbidities) found to be statistically significant in an initial parsimonious block regression model were entered in hierarchical regression models. In block 1, illness morbidity (need) variables were entered first in the model and accounted for 3% of the variance in total home care expenditures. In block 2, when income was added, about 20% of the variance in total home care expenditures was explained. In a final block with demographic characteristics, age, presence of eating problems (e.g., anorexia and cachexia) and GP visits explained 26% of the variance in total home care expenditures.

TABLE 4. Hierarchical regression analysis: predictors for home care expenditures

Predictor Variable <sup>a</sup>	Beta	Standard Error	Confidence Interval (95%)	P-Value
<b>Step 1: Need Variables</b>				
Eating problems	0.17	0.07	0.02–0.31	0.02
Gastrointestinal symptoms	-0.017	0.06	-0.03–0.05	0.007
<b>Step 2: Enabling Variables</b>				
Household income	-0.01	0.01	-0.02–0.01	0.54
General practitioner visits	0.05	0.01	0.04–0.06	<0.0001

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TABLE 4. Continued.

Predictor Variable <sup>a</sup>	Beta	Standard Error	Confidence Interval (95%)	P-Value
Eating problems	0.19	0.07	0.06–0.31	0.01
Gastrointestinal symptoms	–0.13	0.06	–0.24–0.02	0.02
<b>Step 3: Predisposing Variables</b>				
Age	0.01	0.00	0.00–0.01	0.02
Gender	0.04	0.06	–0.07–0.15	0.52
Married (yes)	–0.14	0.08	–0.29–0.01	0.07
Living status (alone)	–0.01	0.09	–0.19–0.17	0.92
Gastrointestinal symptoms	0.08	0.06	–0.04–0.19	0.18
Household income	–0.01	0.01	–0.03–0.01	0.23
General practitioner visits	0.05	0.01	0.04–0.06	<0.0001

<sup>a</sup>  $R^2$  for step 1=0.03; change to  $R^2$  in step 2=0.20; final adjusted  $R^2$  in step 3=0.26

*Predictors for home death*

Multivariate results are summarized in Table 5. In an initial block with illness (need) variables entered, gastrointestinal symptoms were a significant predictor for home death, explaining 3% of the variance. When enabling variables (household income and number of family physician visits) were entered in block 2, household income and GI symptoms predicted home death, explaining 8% of the variance. In the final model (block 3), GI symptoms and household income predicted home death and explained 7% of the variance. In this final model, subjects with GI symptoms had higher odds of dying at home (OR: 1.64;  $p=0.03$ ), as did those with higher median household income (OR: 1.14;  $p<0.001$ ). An increased rate of home death was observed for each \$10,000 increment in household income.

TABLE 5. Hierarchical regression analysis: predictors for home death

Predictor Variable <sup>a</sup>	Odds Ratio	Standard Error	Confidence Interval (95%)	P-Value
<b>Step 1: Need Variables</b>				
Gastrointestinal symptoms	1.82	0.11	0.09–0.51	0.004
<b>Step 2: Enabling Variables</b>				
Household income	1.14	0.04	0.06–0.20	<0.001

TABLE 5. Continued.

Predictor Variable <sup>a</sup>	Odds Ratio	Standard Error	Confidence Interval (95%)	P-Value
General practitioner visits	1.02	-0.02	-0.01-0.06	0.19
Gastrointestinal symptoms	1.86	0.11	0.10-0.52	0.004
<b>Step 3: Predisposing Variables</b>				
Age	1.01	0.009	-0.01-0.02	0.42
Gender	1.16	0.11	-0.14-0.30	0.50
Married (yes)	0.92	0.15	-0.34-0.25	0.79
Living status (alone)	0.75	0.18	-0.50-0.20	0.41
Gastrointestinal symptoms	1.64	0.12	0.02-0.47	0.03
Household income	1.14	0.04	0.05-0.20	<.001
General practitioner visits	1.02	0.02	-0.02-0.06	0.36

<sup>a</sup>R<sup>2</sup> for step 1=0.03; change to R<sup>2</sup> in step 2=0.08; final adjusted R<sup>2</sup> in step 3=0.07

## Discussion

This study is one of few that have examined home care use and place of death in the context of a gold standard palliative home care program in the publicly funded home care system in Canada. Study findings regarding predictors for home death and a higher than average out-of-hospital death rate compared to population norms warrant further research and discussion.

### *Place of death*

A common performance metric used as a quality indicator for EOL cancer care in most Canadian provinces is the percentage of patients who die in acute care hospitals based on an assumption that variation in rates is explained by differential access to high-quality palliative home care services. In Ontario, acute care hospital rates for the metropolitan area, where this study was conducted, reported that 55% of cancer deaths occurred in acute care hospitals, with steady rates over four years (Barbera et al. 2006). This finding compares to the lower rate of 25% of cancer deaths in acute care hospitals observed in this study – lower than acute care hospital death rates across Ontario, which ranged from 38% in heavily populated urban areas to 70% in northern communities (Barbera et al. 2006). Slightly more than 50% of the study population realized a home death, a rate that is also higher than population-based rates of 34% in the United States (Bruera et al. 2002) and 39% in the United Kingdom (Grande et al. 2003).

Although different home death rates may reflect differences in data capture, our study findings may serve as a useful benchmark because they suggest that despite equal access to gold standard palliative home care, about 50% of the study population still required or desired alternative care settings. While our results cannot explain this finding, it is consistent with the literature, which suggests that death at home is not always desired. For example,

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some family values and belief systems may render the home intolerable following a death (Given and Given 1997; Stadjuhur and Davies 1998). Home death may also be inappropriate in situations involving complex symptoms and severe psychological distress (Stearns et al. 1996; Lubin 2000). It is estimated that about 15% of the palliative care population may have complex needs requiring the intensive services of a hospital or hospital-based palliative care unit (National Council for Hospice and Specialist Palliative Care Services 1999). Access to a package of services that includes an adequately resourced palliative home care program, acute/short-stay palliative care units to manage complex symptoms or disease complications, longer-stay palliative care units for protracted dying with physically demanding care needs, or residential hospices for less complicated dying for those whose beliefs or other factors preclude a home death, should be considered in regional service planning (Latimer 1995).

Mechanisms to ensure that patients are identified early and triaged to the appropriate care setting will be a critical component of a well-functioning palliative home care program. More importantly, while home death is considered a desirable outcome of palliative care programs, further research is needed to understand situations in which a home death is inappropriate and may place patients and families at increased risk for poor-quality care. The use of rates of out-of-hospital death as an indicator of quality of EOL care (Barbera et al. 2006) may be premature without adequate explanation of the reasons for variation and whether out-of-hospital death is an appropriate proxy for high-quality palliative care.

### *Predictors of home death*

One interesting finding in our study is that predictors identified in previous research into home death were not observed. In previous studies, older age, male gender, higher socioeconomic status, access to a daughter as a caregiver, stable caregiver health, a preference for home death and the number of informal caregivers have been factors associated with home death (Addington-Hall and McCarthy 1995; Axelson and Christensen 1996; Cantwell et al. 2000; Gomes and Higginson 2006; Grand et al. 1998; Higginson et al. 1999; Karlsen and Addington-Hall 1998; Lock and Higginson 2005; Moinpour and Polissar 1989; Roder et al. 1997; Sims et al. 1997; Tang and McCorkle 2001). In contrast, EOL hospitalization is associated with a diagnosis of haematological cancer, extended period of functional decline preceding death, shorter time from diagnosis to death, unrelieved symptoms such as breathlessness, patient confusion, informal caregiver burden and emotional distress (Berry et al. 1994; Brazil et al. 2002; Bruera et al. 1990; Mann et al. 1993).

Usual drivers for acute care hospitalization observed in previous research may be less important when symptoms are well managed by clinical experts in palliative care and when services are titrated to need. The variation in home care use according to illness characteristics suggests that palliative home care case managers were skilled in tailoring services to meet diverse needs of palliative populations. This skill is considered important in influencing the cost and quality of care (Rafferty et al. 1996). Clinical needs vary according to symptoms and complications that accompany specific cancer diagnoses, particularly in advanced stages of the disease (Ng and von Gunten 1998). For example, gastrointestinal complications such as bowel



obstruction from end-stage ovarian cancer create a demand for clinical monitoring and careful titration of pharmaceutical agents to manage related symptoms of pain, nausea/vomiting and anorexia (Fainsinger et al. 1994). In contrast, cancer patients with neurological complications as a result of primary or secondary brain cancer often have impaired physical mobility and cognitive function, and are at high risk for falls or other problems such as seizures, requiring continuous or round-the-clock supervision (Kemp 1999). An age effect for home care service use is likely explained by the increased number of personal support workers noted for older participants, suggesting the need for increased PSW support to sustain older, and thus potentially frailer, informal caregivers.

### *Income effect*

Also of significant interest was our finding of an income effect for home deaths, given that the population had equal access to publicly funded home care and enhanced specialist palliative care. This finding is consistent with studies in other publicly funded healthcare programs (Cartwright 1992; Goddard and Smith 2001; Hanratty et al. 2007). Increased purchasing power for those in higher social positions has been linked to a demand for services (Coyte and Howell 2000). Higher income may be a proxy for higher education, which might influence patients' and families' ability to advocate for needed services or preferences (Coyte and Howell 2000). Those with higher incomes might also be augmenting traditional home care services with purchased services, such as shift nursing (Coyte and Howell 2000), or may be in more flexible work environments where job loss is not threatened by time off. Researchers have suggested the existence of a two-tiered system of home care, as those who can purchase additional services may be better able to facilitate a home death (Dudgeon and Kristjanson 1995). Sustaining care in the home may not be feasible unless respite care and other purchased services are adequate to supplement informal care (Greaves et al. 2002). Reliance on informal care providers is an assumption embedded in healthcare policy (Romanow 2000). Further research is needed to understand the relationship between income and home death, as well as other variables identified in this study, given the secondary data used in our research.

### *Funding and resource planning*

Palliative home care must be adequately resourced if the home is to be a viable alternative to EOL hospitalization. This study showed that home care for a population of 418 cancer patients, excluding overhead administrative or specialist team charges, requires a significant financial investment. Home care expenditures may be a function of both need and length of stay because some patients' LOS exceeded the six-month palliative home care service eligibility criteria. Certain types of cancer are associated with longer duration of terminal illness in which the dying trajectory may be more prolonged and home care dependency needs may be extended (Allard et al. 1995). Length of stay in the US hospice-based system has been shown to vary according to cancer diagnosis, with lung cancer patients having the shortest LOS (54 days) compared to breast cancer patients (74 days) (Frantz et al. 1999). Prevalence rates for certain types of cancer and some flexibility in funding formulas might be important in regional services planning.

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### *Limitations*

This study has several limitations, largely reflected in the use of secondary data sources that precluded the examination of potentially significant variables that might predict home care use and home death – for example, preferences for place of death, or other contextual or environmental variables not captured in our research. The presence of symptoms and co-morbidities reported by clinicians may not have been a valid proxy for illness severity or clinical needs, and the grouping of symptoms was based on the clinical expertise of the principal investigator (DMH). Study findings may not be generalizable outside the context of a comprehensive palliative home care program in publicly funded health systems, or in differing configurations of primary home care services.

### **Conclusions**

Access to palliative home care services that are organized and sufficiently financed to meet the multidimensional needs of cancer patients at the end of life is necessary if care is to be shifted from acute care hospitals. More importantly, shifting care to the home should not place patients and families at risk for poor quality of dying or death. Further prospective research to understand home care service needs and reasons for use of alternative care settings is important, because needs unfold along the trajectory of advanced, progressive disease. Future research should also examine the underlying reasons for an income effect for home death observed in this study.

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# Changes in Physiotherapy Utilization in One Workforce: Implications for Accessibility among Canadian Working-Age Adults

## Changements dans l'utilisation des services de physiothérapie par la population active : répercussions sur l'accessibilité pour les adultes canadiens en âge de travailler



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THE WORKPLACE UPPER EXTREMITY RESEARCH GROUP

## **Abstract**

In debates over access to essential medical care, comparatively little attention has been paid to the provision of outpatient physiotherapy services. We examined physiotherapy utilization for musculoskeletal disorders (MSDs) among approximately 2,000 employees of a large, unionized, Ontario workplace. We obtained MSD-related physiotherapy claims and service data from the public Workplace Safety and Insurance Board, two private medical insurance carriers, a workplace special fund starting in 1995 and a workplace-contracted, on-site physiotherapy clinic starting in 1999. We observed substantial increases in overall physiotherapy utilization for MSDs: a median of 234 services per quarter for 1992–1994 to 1,281 for 1999–2002. With inclusive workplace provision policies, most physiotherapy utilization occurred on-site by 1999–2002 (70%). With a user-pay orientation to outpatient physiotherapy services increasing among working-age adults in Ontario, there is substantial potential for unequal access among those not privately insured or in workplaces with direct service provision.

## **Résumé**

Dans les débats sur l'accès aux soins de santé essentiels, on porte comparativement peu d'attention à la prestation de services de physiothérapie pour les patients externes. Nous avons étudié l'utilisation de services de physiothérapie pour les troubles musculosquelettiques (TMS) chez environ 2,000 employés d'un grand milieu de travail syndiqué, en Ontario. Nous avons consulté les données sur les services et les réclamations relatives aux soins de physiothérapie provenant d'un organisme public – la Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail – et de deux sociétés privées d'assurance médicale, soit un fonds spécial en milieu de travail qui existe depuis 1995 et une clinique de physiothérapie sur les lieux de travail qui existe depuis 1999. Nous avons observé une augmentation substantielle de l'utilisation générale des services de physiothérapie pour les TMS : une médiane de 234 services par trimestre pour la période 1992–1994 et de 1,281 services pour la période 1999–2002. Avec des politiques éclairées de prestation de services en milieu de travail, la majeure partie de l'utilisation des services de physiothérapie a eu lieu sur place pour la période 1999–2002 (70 %). Avec l'accroissement des politiques d'utilisateur-payeur pour les services externes de physiothérapie chez les adultes ontariens en âge de tra-

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vailler, il existe un véritable potentiel d'inégalité d'accès chez ceux qui n'ont pas d'assurance privée ou qui ne bénéficient pas de prestation de services directs en milieu de travail.

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**I**SSUES ASSOCIATED WITH PARALLEL SYSTEMS OF PUBLIC HEALTHCARE FINANCING (e.g., workers' compensation board benefits and provincial health insurance plans) have recently received considerable attention (Leatt 2008). Private insurance has received less (Bogyo 2008), although it is an important source of payment for such services as chiropractic care and physiotherapy. Almost 9% of Canadians visited a physiotherapist in 2000 (CCHS n.d.), up from 7% in 1994 (NPHS n.d.). Physiotherapy is identified most explicitly in relation to hospital-associated care in the *Canada Health Act*.

The practice of physiotherapy in Ontario is defined as "the assessment of physical function and the treatment, rehabilitation and prevention of physical dysfunction, injury or pain, to develop, maintain, rehabilitate or augment function or to relieve pain" (*Physiotherapy Act*, SO 1991, c.37). A proposal to broaden the scope to include diagnosis is being considered (Physiotherapy Scope of Practice Review 2008).

In Ontario, the *Regulated Health Professions Act, 1991* regulates physiotherapists' practice. Since January 1994, physiotherapists have been considered primary care practitioners. Physician referral is required only if a patient is seeing a physiotherapist in a public hospital or is billing the Ontario Health Insurance Plan (OHIP) for treatments. The public-private mix for physiotherapy has been changing over the last decade (Landry et al. 2007). In Ontario, approximately 39% of physiotherapists practise in hospitals, 35% are in private practice, 8% in home care, 5% in designated physiotherapy clinics and the remainder are found in a range of different sites (College of Physiotherapists of Ontario 2009). Less than 1% work directly in industry. OHIP currently covers physiotherapy services for (a) residents aged over 65 or under 20 years, (b) those who qualified for social support, (c) residents of long-term care facilities and (c) those who are returned to the community following hospital discharge (Ontario Ministry of Health and Long-Term Care 2005). The importance of physiotherapy in home care varies by province and location (Beland and Bergman 2000). "Most provincial health plans provide little or no coverage ... for physiotherapy [among other services] ... . How do we decide what is publicly covered and what is not?" (Stuart and Adams 2007). This question is an important one to Canadians, who take pride in medicare-ensured access to necessary healthcare.

Based on publicly available sources, the breakdown of provider mix and source of financing for rehabilitative care can only be estimated. Colombo and Tapay (2004) report that 65% of Canadians have private health insurance, mainly offered via employers, which provides benefits for healthcare services not typically covered by public schemes (e.g., dentistry, prescription drugs and rehabilitative care). Private health insurance accounts for only 11.4% of total healthcare expenditures in Canada. However, it pays for more than 90% of the approximately 11% of total healthcare expenditures that go towards other professionals (dentists, optometrists, chiropractors and physiotherapists, among others) (CIHI 2009).



The considerable changes in financing and provision of healthcare in general over the past decades (DiMatteo 2000) have affected rehabilitative care in Ontario in particular (Gildiner 2001). In a national key informant survey, McKillop (2005) found that 44% of providers likely had some private financing of physiotherapy delivery, with 43% structurally regarded as private in delivery. He argued that “[m]echanisms should be developed, in consultation with private sector providers, to ensure that private sector delivery activities are fully represented in Canada’s national health databases.”

As part of a collaborative research arrangement with a metropolitan newspaper of approximately 2,000 employees, we negotiated anonymous access to multiple sources of information about physiotherapy utilization. These services were both directly employer provided and financed by third-party payers (i.e., “organizations such as workers’ compensation boards, private health insurance companies, and employer-based healthcare plans that pay for insured health services for their clients and employees” [Health Canada 2007]). We were particularly interested in physiotherapy for musculoskeletal disorders (MSDs), which constitute a substantial disease burden among Ontario’s general (Badley et al. 1994) and working (Choi et al. 1996) populations. Physiotherapy visits were common among those with back problems, and were reported by 15% of those with back pain in the 2000 Canadian Community Health Survey (CCHS) (Jacobs et al. 2004) and 11% of CCHS respondents with repetitive strain MSDs (CCHS n.d.).

Physiotherapy is important for people experiencing MSDs, both those with occupational upper extremity disorders in the US federal workforce (Feuerstein et al. 1998) and among employees at the newspaper in our study (Swift et al. 2001). Further, improved access to physiotherapy was part of a multifaceted program to reduce the burden of MSDs at the newspaper (Polanyi et al. 2005). We sought to describe the mix of providers and financing among the employee population over the period that the workplace parties recognized and responded to MSD injuries (1992–2002).

## Methods

We sought data access with full knowledge of, and approval by, the RSI Committee, a joint labour–management committee that oversaw the RSI program at the workplace (Polanyi et al. 2005). [“RSI” refers to repetitive strain injury, and is the workplace term for MSD injuries. We use the abbreviation here only in reference to the RSI Committee and program.] All data sharing was governed by ethics approval from McMaster University’s Health Research Ethics Board.

### *Data sources and preparation procedures*

We obtained access to individual-level billing data from three different payers: the Ontario Workplace Safety and Insurance Board (WSIB), private health insurance companies and the workplace itself. An overarching research data-sharing agreement between the Institute for Work and Health and the WSIB enabled the research team to obtain WSIB data. The workplace provided entrée to the private health insurance companies, supported researchers to obtain contracted private clinic data and directly shared its own provision data.

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A union representative on the RSI Committee suggested that we seek consent for individual-level data linkage and access to Ontario Health Insurance Plan (OHIP) data. Unfortunately, only about 13% of employees felt comfortable providing such consent, so we could not obtain OHIP data. Nor could we conduct linkages across data sources with traceable individual identifiers.

### WSIB DATA

The Ontario WSIB provides no-fault insurance coverage for workplace injuries and diseases to most Ontario workers and workplaces. Employers must submit claims within three days if a worker gets healthcare treatment (e.g., doctor's visit, physiotherapy care) for a workplace injury or illness. We were able to identify active claims for the workplace (using the firm identification number), determined by either the date of "accident," a healthcare benefit or wage benefit provided during the time period of interest. Beyond the claim number for linking across files, we did not use any personal identifying information. We identified claims for MSDs using a series of available codes on part of body and nature of injury, as per earlier work (Brooker et al. 2001).

The WSIB healthcare benefit file contained information about healthcare services provided by a variety of healthcare providers except physicians. We excluded administrative costs and services incurred to obtain healthcare services (e.g., transportation, hotel), focusing only on delivered physiotherapy services.

### HEALTHCARE INSURER DATA

Many Ontario workplaces offer enhanced medical coverage through a private insurance company for services not covered by OHIP. At the newspaper, two different insurance carriers provided negotiated benefit coverage during the study time period: carrier 1, from prior to the start of observation in 1992 until August 1996; and carrier 2, from August 1996 until the end of the observation period in 2002. All billings for the employees only (i.e., excluding spouses and dependents) were provided by both insurance carriers, stripped of actual identifying information but with pseudo-identification numbers permitting linkage for an individual within each distinct data source, but not across these two data sources (with consequences for Q3 1996, as highlighted in the results).

We used data about licensed physiotherapist billings for persons under the age of 65. Available variables included the pseudo-identifier, age of claimant, service date and amount paid. Unfortunately, diagnostic codes that might designate MSDs or any information to clarify whether the benefit was related to the workplace were not included.

### DATA ABOUT WORKPLACE DIRECTLY FUNDED ACTIVITIES

Through union-management negotiations, employees obtained reimbursement up to approximately CAD\$1,500 per year for treatment of MSDs, starting in 1995. This special fund was explicitly for treatments not covered by OHIP or private health insurance carriers. The 1998 collective agreement made provision for on-site physiotherapy at the workplace. The human

resources department supported research team efforts to obtain quarterly aggregated data, without personal identifiers, about physiotherapy use for both these sources.

Although data about the specific types of physiotherapy care provided were not available for the treatments we studied, we could ascertain the nature of on-site clinic services. Clinicians engaged in stretching, massage, instruction about exercises, adaptation of workstations and guidance about improved self-management (Pam Honeywell, physiotherapist, personal communication) for soft-tissue conditions such as neck and shoulder pain, arm pain and back pain (Cole et al. 2003).

### Measured outcomes

We set out trends in physiotherapy utilization by quarter for the number of unique claimants/clients, the number of bills/services and the total costs. For WSIB data, we also calculated physiotherapy as a proportion of total healthcare costs. The workplace human resources department provided information about the number of employees by year of observation, allowing calculation of rates per capita and per quarter. We calculated summary statistics to contrast utilization more explicitly across three time periods: 1st quarter (Q1) 1992 to 4th quarter (Q4) 1994, for WSIB and health insurance carriers; 1995 Q1 to 1999 Q1, for the special fund; and 1999 Q2 to 2002 Q4, for the on-site physiotherapy provision.

**TABLE 1.** Employee population and claimant/service rates (%) per 1,000 employees, by year

Year	Employees (#)	Ontario WSIB (Workplace Safety & Insurance Board) Claims			Health Insurance Carriers <sup>1</sup>		Special Physiotherapy Reimbursement Fund Claimants (#, rate)	Workplace On-Site Physiotherapy Clinic Clients (#, rate)
		All Claimants (#, rate)	MSD Claimants (#, rate)	Physiotherapy Claimants (#, rate)	All Claimants (#, rate)	Physiotherapy Claimants (#, rate)		
1992	2,160	180 (83)	113 (52)	30 (14)	1,935 (895)	16 (7)	Not Applicable (NA)	
1993	2,021	179 (89)	105 (52)	16 (8)	1,855 (918)	42 (21)		
1994	1,769	151 (85)	103 (58)	21 (12)	1,703 (963)	40 (23)		
1995	1,800	203 (113)	138 (77)	20 (11)	1,701 (945)	46 (26)	22 (12)	NA
1996	1,792	165 (92)	116 (65)	6 (3)	3,360 (1,875)	28 (16)	45 (25)	NA
1997	1,807	135 (75)	73 (40)	<5 (-)	2,026 (1,121)	38 (21)	175 (97)	NA
1998	1,884	150 (80)	93 (49)	8 (4)	2,534 (1,345)	34 (18)	183 (97)	NA
1999	1,879	169 (90)	95 (51)	5 (3)	1,559 (830)	27 (14)	377 (201)	273 (145)
2000	1,914	178 (93)	99 (52)	<5 (-)	1,744 (911)	41 (21)	93 (49)	350 (183)
2001	1,901	219 (115)	125 (66)	15 (8)	1,658 (872)	43 (23)	54 <sup>2</sup> (28)	324 (170)
2002	1,818	161 (89)	71 (39)	6 (3)	1,584 (871)	37 (20)	- <sup>2</sup>	324 (178)
Total claims/clients		1,557	896 (58%)	105 (6.7%)	6,587	312 (4.7%)	- <sup>3</sup>	- <sup>3</sup>

<sup>1</sup> In 1996, the newspaper changed insurance companies from Liberty to Sun Life, and the study was not allowed to identify persons in insurer data sets, so a person might be double-counted.

<sup>2</sup> Data are available up to Q2, 2001 and not thereafter.

<sup>3</sup> Data are not available.

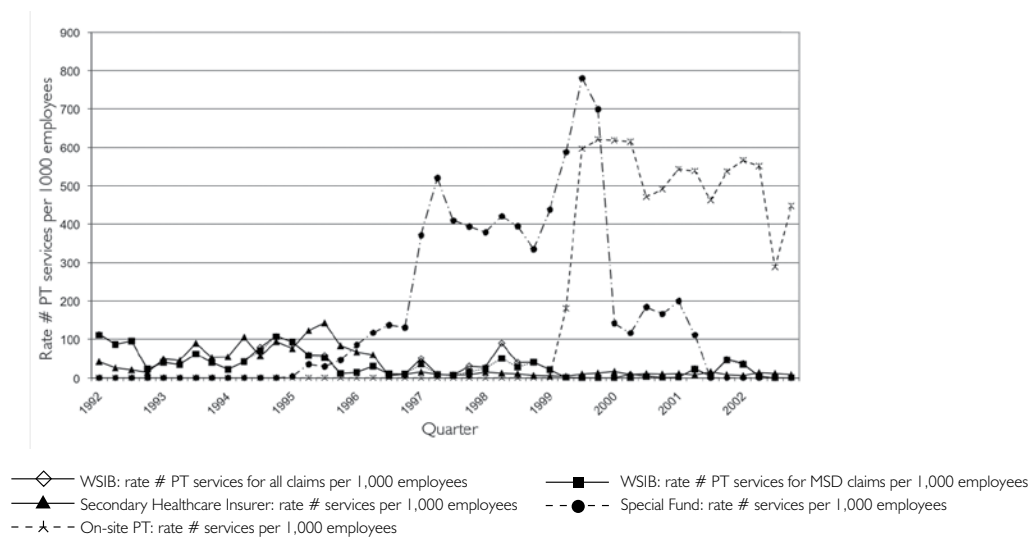
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## Results

Table 1 sets out the number of employees and the number of unique claimants/clients found in each data source on a yearly basis. We extracted a total of 1,890 WSIB claims, defined as “active” claims for workers aged 65 and under during the period under investigation. Of these, 1,131 (60%) were for MSDs, and 132 claimants (7%) made physiotherapy claims. Because of the overlap in private health insurance carriers in 1996, the estimated number of claimants appears larger than the size of the workforce. Further, the number of unique claimants identified from the second carrier’s data was also bigger than the number of employees for years 1997 and 1998, though this carrier indicated that the data contained claims for employees only (no other family members) aged less than 65.

The shifts in numbers of clients from WSIB and private carriers to the special fund are notable in 1995, and from all three sources to the on-site clinic by 2000. Figure 1 demonstrates these patterns graphically for service rates.

**FIGURE 1.** Physiotherapy service rates by different providers and payers (1992–2002)



Aggregated into the periods of interest, the addition of the special fund in Q1 of 1995 resulted in an approximately threefold increase (depending on the measure) in physiotherapy services used per quarter. The presence of an on-site service increased utilization by another three times (again, depending upon the measure) (see left-hand columns in Table 2). The shift in financing from WSIB and health insurance carriers is also apparent, first to the special fund, and then to employer-provided on-site services.

**TABLE 2.** Physiotherapy utilization and associated costs, by period

	Services			Costs		
	Total # in the corresponding entire period (mean; SD by quarter) [median by quarter]			Total \$ in the corresponding entire period (mean; SD by quarter) [median by quarter]		
	1992Q1-1994Q4	1995Q1-1999Q1	1999Q2-2002Q4	1992Q1-1994Q4	1995Q1-1999Q1	1999Q2-2002Q4
Ontario WSIB claim	1,466 (122.2; 67.6) [103]	935 (55; 41.5) [46]	227 (15.1; 27.2) [2]	42,266.00 (3,522.17; 2,974.14) [2,959.50]	17,520.00 (1,030.59; 1,138.48) [756.00]	4,266.00 (284.40; 501.79) [54.00]
Health insurance carriers	1,249 (104.1; 50.5) [98]	1,190 (70; 80.2) [23]	295 (19.7; 6.4) [19]	15,149.60 (1,262.47; 635.98) [1,195.60]	30,679.00 (1,804.65; 809.85) [1,671.40]	25,836.49 (1,722.43; 926.44) [1,496.20]
Special fund	NA	7,813 (459.6; 331.2) [630]	5,641 (626.8; 511.7) [353]	NA	418,483.48 (24,616.68; 19,164.42) [33,007.64]	303,576.92 (33,730.77; 28,156.14) [17,242.91]
On-site	NA	NA	14,153 (943.5; 237.3) [1,021.0]	NA	NA	576,607.85 (38,440.5; 8,132.83) [40,663.76]
Total	2,715 (226.3; 81.5) [234.0]	9,938 (584.6; 264.9) [718.0]	20,316 (1,354.4; 552.7) [1,281.0]	57,415.60 (4,784.63; 3,047.06) [4,740.30]	466,682.48 (27,451.91; 18,643.55) [35,155.24]	910,287.26 (60,685.82; 25,007.48) [52,133.98]

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Cost increases surpassed utilization increases. There were associated differential costs per service: an eightfold increase overall from 1992–94 (57K) to 1995–99 Q1 (467K). However, these increases took place over four years in the second period, compared to three years in the first. A further near-doubling of costs occurred in the 1999 Q2 to 2002 period (910K vs. 467K in 1995–99 Q1) (see right-hand columns of Table 2). In keeping with the shift away from WSIB financing, physiotherapy costs became a decreasing proportion of overall WSIB healthcare benefit costs: more than 30% from 1992 to 1995 versus less than 10% for 1999 on. This decline was due to a reduced number of claims, and a lower median and mean cost of services per claim (see Table 3).

**TABLE 3.** Physiotherapy costs for MSD claimants paid directly by the Ontario WSIB, by year

Year	Physiotherapy costs (CAD\$)				All healthcare costs (CAD\$)	
	n	Median	Mean (SD)	Total (% of all healthcare costs)	Median	Total
1992	30	652	715 (618)	21,452 (47%)	84	46,054
1993	16	521	590 (521)	9,440 (34%)	89	27,884
1994	21	392	539 (504)	11,325 (40%)	89	28,648
1995	20	244	431 (474)	8,622 (36%)	52.5	24,033
1996	6	171	242 (232)	1,451 (9%)	44	16,117
1997	<5	501	496 (31)	1,489 (12%)	46	12,850
1998	8	576	603 (279)	4,822 (39%)	46	12,245
1999	5	18	244 (328)	1,221 (7%)	63	17,130
2000	<5	83	83 (61)	166 (0.6%)	63	27,616
2001	15	54	178 (246)	2,677 (7%)	85	37,630
2002	6	131	231 (272)	1,387 (9%)	71	16,285

Healthcare costs include those for actual healthcare services but exclude those for transportation, vocational rehabilitation, accommodations, etc.

## Discussion

We documented dramatic increases in physiotherapy utilization over the 11 years, accompanied by substantial shifts among providers and payers. In the absence of reasonably valid data in the public domain about financing physiotherapy utilization across a range of sources, our efforts are an important benchmark for Canadian research. They respond to McKillop's (2005) call and provide a far clearer picture of physiotherapy utilization among a working population.

With the availability of the special fund, increases in physiotherapy use may have been due to reduced financial barriers and greater affordability, comparable to the removal of user fees for other medical services. The second rise may have been due to several factors. An active workplace campaign encouraged early reporting and treatment, likely prompting employees to come forward with MSDs that they had not dealt with previously (Polanyi et al. 2005) or to seek physiotherapy to reduce pain and improve function.

Greater geographical accessibility (on-site vs. off-site) was important for employees and their supervisors. The latter were more likely to support employee treatment when time away from work was minimized. On-site clinic data showed declines in presenting symptom duration over the years 1999 to 2002 (Cole et al. 2003), indicating that employees were seeking treatment earlier. As well, on-site providers had useful skills – the physiotherapists were more experienced with MSDs typical in office work settings – and took more time in treatment and education (Pam Honeywell, personal communication).

There are several limitations in the findings presented. Identifying individuals in the second insurance carrier's data led to overestimation of the number of claimants. However, given that we had an independent measure of workforce size directly from the company, this should not affect our per capita utilization rate estimates. Our inability to obtain OHIP data likely led to underestimation of total utilization and of publicly funded contributions. We also missed physiotherapy reimbursed under a plan held by a spouse or other family member and out-of-pocket payments to physiotherapists. We expect these last would be minimal in a unionized workforce with extended health benefits and other provisions, such as the special fund, in comparison to other populations without these resources (CIHI 2009). However, employees might have used each of these in the period from 1992 to 1996, and then transferred some of this unmeasured utilization to the special fund and worksite services from 1997 onwards. The extent of such a transfer is hard to estimate accurately. Given what we know from existing surveys on physiotherapy utilization and our own experience as worksite researchers and as clinicians serving working patients, we do not think such transfers would represent more than 20% of utilization increases.

If improved affordability and geographic accessibility promoted more timely physiotherapy utilization, we can ask, "What other criteria would contribute to describing such services as 'medically necessary'?" Some payers, particularly insurers, might argue that without the imprimatur of a physician diagnosis and referral, not required for the on-site clinic nor for physiotherapy services more generally in Ontario, then the services could not be classified as medically necessary. However, physician control of access to other health professionals is increasingly being questioned by nurse practitioners, physiotherapists (Massey 2002) and, more recently, by governments moving towards coordinated, interprofessional care arrangements (Interprofessional Care Steering Committee 2007). Hence, the term "medical" has been expanded in meaning to include clinical care more broadly rather than physician-sanctioned or supplied.

Another common approach to assessing "necessary" services considers the effectiveness of the clinical services. A spate of relevant systematic reviews of effectiveness for the types of

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conditions seen and physiotherapy treatments applied in the on-site physiotherapy facility, at least, are available. Despite the caveats that systematic reviewers note around the uneven quality of clinical research available, evidence for effectiveness should at least meet requirements to substantiate medical necessity, as summarized in Table 4.

**TABLE 4.** Evidence available from systematic reviews on physiotherapy treatment effectiveness

Condition	Treatment	Effectiveness	1st Author (year)
Mechanical neck disorders	Exercises	Limited evidence of benefit for strengthening, stretching and strengthening exercises for neck disorder with headache. Limited evidence of benefit for active range-of-motion exercises or a home exercise program for acute mechanical neck disorder. Unclear evidence of benefit for a stretching and strengthening program in chronic mechanical neck disorder.	Kay et al. (2005)
Non-specific neck pain	Massage	Uncertain	Ezzo et al. (2007)
	Manual & supervised exercise interventions	For subacute or chronic non-specific neck pain, more effective than no treatment, sham or alternative interventions.	Hurwitz et al. (2008)
	Interventions focused on regaining function & return to work	For neck pain without radicular symptoms, relatively more effective than interventions that do not have such a focus.	
Shoulder pain	Exercise	Effective in short-term recovery and longer-term benefit to function.	Green et al. (2003)
Work-related complaints of the neck, shoulder or arm	Exercises	Conflicting evidence concerning efficacy vs. no treatment.	Verhagen et al. (2006)
Lateral epicondylitis (elbow)	Exercise	Positive effects in the reduction of pain or improvement in function.	Trudel et al. (2004)
Low-back pain	Exercise	Slightly effective at decreasing pain and improving function in adults with chronic low-back pain. In subacute low-back pain, some evidence that a graded activity program improves absenteeism outcomes.	Hayden et al. (2005)
	Massage	Might be beneficial for patients with subacute and chronic non-specific low-back pain, especially when combined with exercises and education.	Furlan (2002)



Hence, we argue that such treatments should be accessible to those with MSD conditions in working-age populations. The newspaper took an inclusive approach, not differentiating between workplace “caused,” “aggravated” or “prevalent” MSDs and more concerned about improving function, both for employee well-being and productivity. Further, these newspaper workers were among the approximately 30% of Canadian workers who are unionized (Strategic Policy, Analysis and Workplace Information Directorate 2008). They were more likely to have benefits than the non-unionized majority of workers. The latter must rely on less common employer-based private insurance benefits, WSIB benefits for the small percentage with MSDs deemed “work-related,” or employment insurance healthcare benefits for those who lose their job because of their MSD. They may face issues of access to physiotherapy services (e.g., geographic, financial, time), as witnessed by the low rate of physiotherapy utilization observed in the early years of this study.

Publicly funded physiotherapy services are unlikely to fill the gap, as provincial health insurance programs among those aged 20 to 64 have become more restrictive, rather than less (Gildiner 2001; Landry et al. 2007). As the OHIP circular announcing policy changes noted under frequently asked questions: “Q: Will my employer or my insurance company now pay for the whole cost of these [physiotherapy] services? A: This depends on the employer’s insurance policy. Individuals should speak with their employers about their plan” (Ontario Ministry of Health and Long-Term Care 2005). Recent studies show that access to physiotherapy is impeded in the current system for people with chronic conditions, those lacking private healthcare and those living in less urban regions (Cott et al. 2007). Documenting changes before and after the delisting of physiotherapy services in Ontario, Landry and colleagues (2006) showed that 18% of physiotherapy patients discontinued their physiotherapy after delisting because they could not pay for it. In an increasingly competitive global marketplace, the generosity observed at this newspaper is likely not common among employers, nor may it be sustainable.

The extent to which constraints on accessibility to effective treatments such as physiotherapy services are deemed to infringe upon the access provisions enshrined in medicare (Stradiotto 2007) remains an important issue for Canadian healthcare policy makers over the coming years. Landry and colleagues (2006) showed that patients who were able to maintain access to physiotherapy after delisting were 10 times as likely to report good or excellent self-rated health compared to the patients unable to continue with physiotherapy. However positive this finding may seem, selection effects are likely present (i.e., the most vulnerable and poorest may have been less likely to be able to maintain access, and they would have poorer health status to begin with). We argue that such vulnerable groups should be given first consideration in support for access to physiotherapy services, a principle recognized by some provincial medicare plans that retain coverage of services to those >65 and <20 years of age. Some provinces and communities have chosen another route, including physiotherapy in community health centre services, particularly for those CHCs serving large senior populations (e.g., in Ontario, community care access centres for senior citizens upon hospital discharge but with strict limitations on eligibility [Ontario Ministry of Health and Long-Term Care 2007;

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Ontario Physiotherapy Association 2009], community rehabilitation services for low-income persons in Alberta [Alberta Health Services 2010] and in Manitoba with Aboriginal health and the Geriatric Program Assessment Team [GPAT] of the Winnipeg Regional Health Authority [Fricke 2005]).

### Conclusion

In light of shorter hospital stays and continued occurrences of injuries in communities and workplaces, and the ongoing burden of chronic MSDs, many patients in the community need rehabilitative services. Their growing dependence on private physiotherapy services, with resulting inequities in access, requires a review of services covered under the concept of “universal healthcare” in Canada. Cost-minimization analyses might support coverage of a broader range of patients by provincial plans (e.g., patients whose maintenance in the community with adequate outpatient physiotherapy would prevent re-hospitalization, and working-age adults whose treatment would let them return to productive employment, reducing other social welfare costs).

Just as Canadians uphold medicare to employers as a social benefit (deemed a “subsidy” by US free-trade advocates), we argue that ensuring public coverage of physiotherapy and other rehabilitative services would support small- and medium-sized employers and their employees, who together cannot finance adequate private benefit plans. Such options might confront both the “crisis in access” that physiotherapists’ associations have highlighted (e.g., see <http://www.opa.on.ca>) and tackle the burden of MSDs. Sustaining healthy, productive small- and medium-sized workforces is in the interests of Canadian families and communities that depend upon them. We hope our findings inform a dialogue about such options.

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Policy is always in the making. This journal is designed to serve readers from diverse backgrounds including health system managers, practitioners, politicians and their administrators, educators and academics. Our authors come from a broad range of disciplines including social sciences, humanities, ethics, law, management sciences and knowledge translation. They want good policy – a foundation for best practices.

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