HEALTHCARE

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Politiques de Santé

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

Volume 6 • Number 4

Will Paying the Piper Change the Tune?

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Data Matters • *Discussion and Debate* • *Research Papers*

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HEALTHCARE
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Healthcare Policy/Politiques de Santé seeks to bridge the worlds of research and decision-making by presenting research, analysis and information that speak to both audiences. Accordingly, our manuscript review and editorial processes include researchers and decision-makers.

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

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

* * *

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

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

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

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Peer Reviewed

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VALÉRIE LEMIEUX, JEAN-FRÉDÉRIC LÉVESQUE ET DEBBIE EHRMANN-FELDMAN

Cette étude, effectuée auprès de 776 patients atteints de maladie chronique et suivis dans 33 établissements de première ligne au Québec, indique que les caractéristiques organisationnelles n'ont pas d'impact significatif sur les autosoins des patients. Les patients indiquent généralement qu'ils reçoivent peu de formation en autosoins de la part des organisations.

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Examen par les pairs

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EDITORIAL

Old and New: Influencing Health Policy Debates

With a federal election in full swing and several provincial elections just around the corner, it seems appropriate that this issue of *Healthcare Policy/Politiques de Santé* features a retrospective analysis of the approaches through which political science has studied medicare over the last six decades.

In some respects, we have witnessed tremendous change since the Second World War, both in our society as a whole and in healthcare. However, as Michael O'Neill, Dylan McGuinty and Bryan Teskey point out, there has been a near-consensus throughout this period among the scholarly community that medicare is "a defining characteristic of the country and its people."

Attributing significance to the health system as a deep, lasting and defining national characteristic is not unique to Canada. For example, Nigel Lawson once remarked that "the NHS is the closest thing the English have to a national religion." Thus, the debate currently underway on the reform of the National Health Service is particularly interesting for Canadians. While there is little disagreement on the stated goals of the reform (improving quality and outcomes for patients and making health services more patient-centred), there is fierce opposition on a number of fronts to the government's proposals for how to achieve these goals in practice (Walshe and Ham 2011).

Enter social media as a new force in the policy debate, albeit admittedly perhaps not on the same scale as in North Africa. The Andrew Lansley Rap (www.youtube.com/watch?v=Dl1jPqqTdNo) has gone viral. Martin McKee reports in the *BMJ* on what is being said about the reforms on Twitter (McKee et al. 2011). And Google Trends shows significant spikes in UK-based searches on NHS reform since mid-2010, far exceeding volumes in earlier years.

Reaching out through social media is a new challenge for all those interested in health policy. Whether you feel passionate about primary healthcare, home care, performance measurement or any of the other topics featured in this issue of *Healthcare Policy/Politiques de Santé*, how do you plan to engage in the debate?

Producing any journal is a team effort. As an editorial team, we wish to pay special tribute this month to all those who have volunteered their time over the past year to serve as peer reviewers for *Healthcare Policy/Politiques de Santé*. Their thoughtful commentaries and advice are essential to ensuring the quality and relevance of the papers that we publish in the journal's pages. A full list of reviewers is included on page 88. I would like to take this opportunity to thank them all for their important contributions over the course of the last year.

If you are interested in joining their ranks next year, please take a few minutes to register at www.longwoods.com/reviewer-registration/healthcare-policy. We have recently updated our database of potential reviewers to make it easier to match papers that we send out for comment with the expertise and interests of reviewers. By registering, you can help to advance scholarship and evidence-informed debate in health policy, both in the journal's pages and beyond.

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McKee, M., K. Cole, L. Hurst, R.W. Aldridge and R. Horton. 2011 (February 18). "The Other Twitter Revolution: How Social Media Are Helping to Monitor NHS Reforms." *British Medical Journal* 342: d948; doi: 10.1136/bmj.d948.

Walshe, K. and C.J. Ham. 2011. "NHS Reform: Can the Government's Proposals Be Made to Work?" *British Medical Journal* 342: d2038.

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

ÉDITORIAL

Du vieux et du neuf : influence sur les débats en matière de politiques de santé

Alors que l'élection fédérale bat son plein et que plusieurs élections provinciales sont sur le point d'être déclenchées, il semble adéquat que ce numéro de *Politiques de Santé/Healthcare Policy* publie une analyse rétrospective des démarches employées par la science politique pour étudier l'assurance maladie au cours des soixante dernières années.

À certains égards, nous avons connu des changements considérables depuis la Deuxième Guerre mondiale, tant dans nos sociétés en général que dans les services de santé. Cependant, comme l'indiquent Michael O'Neill, Dylan McGuinty et Bryan Teskey, pendant toute cette période il y a eu quasi consensus dans le milieu de la recherche pour dire que l'assurance maladie est « une caractéristique qui définit le pays et ses citoyens. »

Le fait d'attribuer une telle importance au système de santé, comme caractéristique nationale profonde et durable, n'existe pas uniquement au Canada. Par exemple, Nigel Lawson notait que « le National Health Service (NHS) est ce qu'il y a de plus proche d'une religion nationale pour les Anglais. » Ainsi, le débat en cours au sujet de la réforme du NHS intéresse particulièrement les Canadiens. Bien qu'il y ait peu de différends sur les objectifs visés par la réforme (améliorer la qualité et les résultats pour les patients et rendre les services de santé plus axés sur les patients), de nombreux fronts exercent une forte opposition aux propositions du gouvernement sur les moyens d'atteindre concrètement ces objectifs (Walshe et Ham 2011).

Les médias sociaux représentent une nouvelle force de participation aux débats politiques, quoique sans doute à moindre échelle que ce qu'on observe en Afrique du Nord. Le rap d'Andrew Lansley (www.youtube.com/watch?v=Dl1jPqqTdNo) est très populaire. Martin McKee fait état, dans le *British Medical Journal*, des commentaires sur la réforme affichés dans Twitter (McKee et al. 2011). Et le site Google Trends indique, au Royaume-Uni, d'importantes pointes de consultations sur les réformes du NHS depuis la mi-2010, beaucoup plus que dans les années antérieures.

La communication par l'entremise des médias sociaux présente un nouveau défi pour tous ceux qui s'intéressent aux politiques de santé. Que vous vous intéressiez aux soins de santé primaires, aux soins à domicile, aux mesures du rendement ou à tout autre sujet présenté dans ce numéro de *Healthcare Policy/Politiques de Santé*, comment avez-vous l'intention de participer au débat?

La publication de toute revue est un travail d'équipe. L'équipe de rédaction souhaite rendre un hommage particulier à tous ceux qui ont offert bénévolement leur temps, cette année, comme pair évaluateur pour *Politiques de Santé/Healthcare Policy*. Leurs avis et leurs commentaires éclairés sont essentiels pour assurer la qualité et la pertinence des articles que nous publions. La page 88 présente une liste complète de tous les évaluateurs. Je profite de l'occasion pour les remercier de l'inestimable contribution qu'ils ont apportée au cours de l'année écoulée.

Si vous souhaitez être évaluateur l'année prochaine, veuillez prendre le temps de vous inscrire à l'adresse suivante : www.longwoods.com/reviewer-registration/healthcare-policy. Nous avons récemment mis à jour la base de données d'évaluateurs potentiels afin de faciliter le jumelage des articles avec l'expérience et les intérêts des évaluateurs. En vous inscrivant, vous contribuez à l'avancement de débats de recherche éclairés en matière de politiques de santé, tant dans les pages de la revue qu'ailleurs.

RÉFÉRENCES

McKee, M., K. Cole, L. Hurst, R.W. Aldridge et R. Horton. 2011 (18 février). "The Other Twitter Revolution: How Social Media Are Helping to Monitor NHS Reforms." *British Medical Journal* 342: d948; doi: 10.1136/bmj.d948.

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Will Paying the Piper Change the Tune?

Payer le bal permettra-t-il de mener la danse?

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Abstract

Most provincial governments are considering or introducing changes to hospital funding. Ten years of rapidly increasing expenditures have left them still facing complaints of waiting lists and waiting times. Activity-based funding (ABF) would supplement traditional negotiated global budgets, reimbursing a predetermined amount for each case treated – essentially, a "fee schedule" – thus providing incentives and resources to increase throughput of certain "hot button" procedures and services and to improve efficiency.

Maybe. ABF-type systems in other countries date back over 20 years; the results are very mixed. What is clear is that information and reporting requirements are substantial. A host of perverse incentives lurk in ABF. Most Canadian hospitals and provincial governments do not now have the necessary data systems, so are wise to proceed cautiously.

Résumé

La plupart des gouvernements provinciaux entrevoient la possibilité d'apporter des changements au financement des hôpitaux, ou sont déjà en train de le faire. Après dix ans d'accroissement rapide des dépenses, ils font encore face à des plaintes concernant les listes d'attente et les temps d'attente. Le financement à l'activité permettrait de compléter les budgets globaux traditionnellement négociés, et ce, en remboursant un montant prédéterminé pour chaque cas traité – essentiellement, une « grille tarifaire » – offrant ainsi des incitatifs et des ressources pour accroître la vitesse de traitement de certains services ou procédures, dans le but d'améliorer l'efficacité.

C'est possible. Dans d'autres pays, les systèmes de financement à l'activité datent de plus de 20 ans; et les résultats sont très variés. Il est clair que les exigences en matière d'information et de rédaction de rapports y sont considérables. Il existe un lot d'incitatifs pernicieux associés au financement à l'activité. La plupart des hôpitaux canadiens et des gouvernements provinciaux n'ont pas encore les systèmes de données nécessaires, ils doivent donc procéder avec précaution.

* * *

> Beware of Incentives. Economists and other rationalists restlessly tinker with people's incentives. This is a dangerous game. … Give doctors incentives to be more efficient and they suddenly seek out healthy patients and spurn sick ones. … A great many uninvited incentives lurk in each policy change. (Morone 1986)

There is a new flavour being sold in health policy shops across the country. Global budgeting for hospitals is (on its way) out, activity-based funding (ABF) is (rushing) in. Each province is adding its own subtle ingredients to ensure that its version is unique. This trend affords wonderful opportunities for comparative evaluation research. But we may not need to wait to get a sense of what is afoot; and the likely consequences, based on an examination of the objectives, the mechanisms of action, experiences elsewhere and some of the implementation challenges.

What's It All About?

The way most Canadian hospitals are funded has not changed in decades (Barer 1995). There is a reason; global budgets offer predictability and controllability. When the global amounts are based largely on past experience, however, opportunities to improve efficiency and quality may be lost. Hospitals may have little incentive to innovate (McKillop et al. 2001). Complaints about inflexibility in staffing, rigidity in management, perpetuated inter-hospital inequities, chokepoints in wards ("bed blockers") and emergency rooms and the like have become commonplace.

Is ABF the answer? At time of writing, forms of ABF have been adopted or announced in British Columbia, Alberta and Ontario, and most other provinces are using or talking about variants (often with other labels). Ten years ago, this phenomenon was barely on the radar.

The idea is simple – by paying hospitals to do what the funder wants done, rather than simply giving them a fixed budget and letting them decide how to spend it, one can steer them to, say, reduce wait times for particular procedures. The challenge is to identify the sweet spot where the incentives for hospitals to meet target utilization levels are neither too hot (funders overpaying) nor too cold (hospitals not responding).

Roughly, hospitals' costs can be divided into those that are fixed, incurred in order to keep the hospital open, and those that vary with the volume of (particular types of) patients. Reimbursement that covers (slightly more than) the variable costs permits and encourages the hospital to expand its patient load, subject to the overall capacity of the organization. Because variable costs will differ with the types of procedures or services provided, and with the nature (complexity and severity) of the patient's condition, considerable attention must be given to getting the implicit price structure "right." The hotter the incentives, the fewer savings there are for the funder. Indeed, a key way for funders to gauge whether they have the prices right is to observe hospitals' responses to those prices.

If hospitals have the necessary information systems in place, one might expect them to shift their case- and severity mix towards cases with higher margins of payment over variable cost. Hospitals would also be rewarded for changing their input mix in order to reduce costs for any given mix of cases. Thus, we might expect shorter lengths of stay and higher numbers of patients treated per bed-year. From the funder's perspective, advantages include the ability to target funds to areas identified as priorities.

The recent provincial enthusiasm for ABF appears to be a response to political pressures over the past decade, generated by frequent high-profile claims of long wait lists and wait times, particularly for certain hospital-based surgical procedures. To the frustration of provincial governments, these claims have persisted despite large recent increases in hospital funding. Hospital spending forecasts for 2010 are $55.3 billion, double the $26.8 billion in 1999. Per capita, adjusted for inflation, this represents a "real" increase of 36.4% in 11 years. In 2004, the federal government contributed $5.5 billion through the Wait Time Reduction Fund. Yet long wait lists persist, even for the very procedures targeted by that fund. Where did the money go?

The answer, under global budgeting, is "wherever hospitals have chosen to put it." One might at least speculate that since continuous publicity over waiting lists and shortages has placed public pressure on provincial governments to keep the money flowing, their elimination might not be the highest priority for hospital managers and physicians. Certainly, that is where the economic incentive trail leads.

What Can Others' Experiences Tell Us?

Canadian policy makers are not at the leading edge of the ABF movement; they are not starting from a blank sheet of paper. At least three decades of work in other countries, dating back to the development of diagnosis-related-groups (DRGs) in the United States (Fetter et al. 1980), have gone into developing and refining methods of estimating measures of case-specific costs. The American Medicare program (for those 65 and over) introduced the Prospective

Payment System (PPS) in October 1983. Hospitals would henceforth be reimbursed a predetermined amount for each in-patient case treated, regardless of actual costs. The amount would be determined by the average cost of the DRG to which the case was assigned – in essence, a form of "fee schedule." ABF variants have since been adopted by the majority of industrialized and newly industrialized countries across the globe. So there are more than two decades of international experience. Has ABF worked?

Well, yes and no. The American PPS system certainly modified hospital behaviour – acute care occupancies and lengths of stay fell sharply. But expenditure (trends) did not. Total DRG-based payments were never "capped" and hospital activities and costs were shifted to other public reimbursement programs outside the PPS constraints, such as nominally "free-standing" diagnostic facilities, long-term care and rehabilitation. An army of consultants sprang up using computer-based models to show hospitals how to "game" the system and maximize reimbursement. If "working" means moderating the escalation of hospital costs, the first major ABF program was a spectacular failure.

By contrast, the Canadian experience with the blunt instrument of budgetary squeeze, applied in the mid-1990s, did work. Hospital costs fell along with in-patient utilization, as efficiencies that had been known for decades were finally forced into use. The political costs were high as everyone in the hospital sector declared that the sky was falling. Cost reductions are, by definition, income (actually, job) reductions as well. But if the objective was cost containment, squeezing global budgets worked.

Beyond North America, ABF-style applications have become commonplace (see, for example, Ettelt et al. 2006; Moreno-Serra and Wagstaff 2009). At certain times and in certain countries and circumstances, they appear to meet at least some of their announced objectives. Appropriately structured ABF has been shown to encourage both a shift of some in-patient procedures to outpatient care, and reduced in-patient lengths of stay. But the evidence is far from unequivocal. Some ABF-funded hospitals have shown declining productivity (Mikkola et al. 2001), increased costs and "up-coding" (re-coding patient complexity/severity to more highly reimbursed DRGs). There appears to be no general conclusion about the effects of ABF (Sutherland 2011), with one exception. Hospitals will figure out the highest margins of reimbursement over cost, and migrate activity there.

Implementation Challenges

There are a number of well-known risks associated with reimbursing institutions based on volumes of specific types of cases treated. First, no matter how precisely the patient groups are defined, there will always be some mix of overpayment for straightforward cases and underpayment for "right-tail" (extraordinarily high-cost) patients. It may be necessary to "trim" the highest- and lowest-cost patients in each group and reimburse them at cost. Second, hospitals may unbundle episodes of care (creating separate acute and rehabilitation episodes), or admit patients for services that can be, and have previously been, offered on an outpatient basis. Third, "case complexity creep," or up-coding, is a common feature of ABF reimbursement methods everywhere. Fourth, hospitals can be expected to "cherry-pick" if offered reimbursement in excess of variable costs for dealing with some types of services or procedures but not others, particularly where capacity (e.g., operating rooms) is constrained and shared across multiple procedures. Higher-margin patients will get treated at the expense of lower-margin patients – one wait list is shortened at the expense of growth in others. Fifth, one (reimbursement) size will almost certainly not fit all. Regional variations in input prices will be reflected in regional variations in variable costs, irrespective of the relative efficiency of different institutions. Sixth, absent a global budget for ABF itself, funders take on significant additional financial risk. These negative "side effects" are not just hypothetical; all are logical responses to the incentives embodied in ABF and have emerged in other jurisdictions (Sutherland 2011).

It is also unrealistic to expect that one can move to an ABF system overnight. All jurisdictions adopting such systems have started small and moved forward incrementally. Phase-in periods have tended to run about four to six years. Furthermore, while a funding model involving global budgets for fixed costs and ABF for variable costs is intuitively appealing, there is no gold standard with respect to how far along the blended funding spectrum a jurisdiction should go. One finds quite a range – from about 40% ABF in Norway and parts of Denmark, to 70% in parts of Sweden.

Are Canada's Hospital Information Systems Up to the Task?

The principal informational challenge with ABF is defining the fee schedule – setting prices for the care of different types of patients. There is an entire cottage research industry dedicated to defining and refining case-mix groups. The more narrowly defined the groups, in terms of diagnoses and other patient characteristics such as age or co-morbidities, the more homogeneous are the patients within them. As the groups become more broadly defined, the "prices" for each are averaged across a more diverse range of case types and the dispersion of actual costs around the reimbursement rate increases. Hospitals will then tend to select those patients within groups likely to provide the largest margins of reimbursement over costs.

The Canadian Institute for Health Information (CIHI) has led the local methodologic effort to develop case mix groupings (CMG+) and estimate "prices" that represent the cost of the "average" patient within each group. But whereas most systems have settled on anywhere from 500 to 1,400 patient groupings, CIHI's 565 CMG+ groups include additional sub-strata for high-cost procedures, return trips to the operating room, and age groups plus prevalent co-morbidities, leading to thousands of possible combinations. In principle, the case "price" for each group can still be calculated by averaging case costs across all hospitals in the system, but the number of such cases in any one hospital may be very small (or zero). The limit, when each group contains only one (unique) patient, is an elaborate system of cost-based reimbursement!

Any ABF system based on CMG+, irrespective of the number of categories, comes with extensive, complex and detailed information collection and analysis requirements. Having historically been funded by global budgets, Canadian hospitals have not developed systems to estimate the variable costs in each CMG based on a detailed department-by-department analysis of patient-level cost data, including detailed activity logs of nursing and other staff hours stratified by permanent or contract staff, detailed examination of clinical data derived from the discharge abstract, detailed consumable/materials tracking systems and information gleaned from labour contracts. Thus, many hospitals are not (yet) up to the task of reporting reliable data for estimating locally relevant fixed and variable costs by CMG+ category. Implementing the necessary costing systems will be complex and costly. Hospitals in Ontario and Alberta are partial exceptions, but even there, additional work is required to untangle the costs of salaried physicians and of teaching and research activities within hospitals. Even where the necessary information is (mostly) available, the expertise necessary to convert the data to an ABF payment system is also, at present, scarce in most hospitals, health authorities and ministries of health across the country. The lack of a standardized costing methodology, and of experience in its use, represents very real challenges to any near-term implementation of a finely tuned ABF system. The cautious pace at which funds are currently being distributed through ABF mechanisms in Canada likely reflects the fact that the necessary management tools are simply underdeveloped.

Other Considerations

Among the publicly voiced objectives of ABF variants in some provinces has been "quality improvement" in the sense of encouraging the movement of patients to the most appropriate levels of care – i.e., out of acute care (Vertesi 2011). Global budgets provide no incentive for hospitals to discharge at the earliest possible moment (because bed blockers – those waiting for appropriate discharge – will tend to be lower-cost patients). However, absent significant progress on the development of capacity in alternative institutions and home support programs, which is not currently happening (Chappell and Hollander 2011), where are the bed blockers to go?

It also seems somewhat ironic that, as provinces have moved increasingly away from ABF payment mechanisms for physicians, they are moving towards them from hospitals. There may be important lessons in the most recent agreement negotiated between government and doctors in British Columbia. That agreement contained significant new funding intended to encourage physicians to provide more evidence-informed care.[1] Physicians and hospitals will now both receive funds through two separate tranches – the main negotiated amount (fee schedule, global budget), which remains largely unscrutinized as to appropriateness, and supplementary amounts to promote modes of delivery or types of services that are priorities for funders.

For physicians, this dual-payment arrangement has been associated with both rapidly increasing physician service costs and labour relations peace. Should one not expect the same from the hospital sector in an environment with sufficiently rich ABF "prices"? Yet, senior policy makers and individuals involved in the ABF initiative in British Columbia have identified reducing the rate of cost escalation as a priority for government.

Why Here? Why Now?

If reduced cost escalation is a key objective, is turning the reimbursement system for acute care hospitals inside-out the best place to focus so much attention? Well, yes and no.

Yes, on the Willie Sutton principle. Hospitals account for nearly 30% of total health spending and 40% of provincial government health spending. Their costs have nearly doubled since 2000. Prescription drugs, which were for decades the most rapidly growing sector of health spending, have recently seen their growth cut sharply, and anyway such costs made up less than 10% of provincial government health outlays in 2010. Hospital costs have five times the budgetary impact.

But no, on both "cost driver" and "fastest growth" principles. In the last five years, physician costs have risen by 47%, increasing their share of the healthcare pie to 13.7% (and 20.4% of provincial government outlays). With the rapid projected increase in new graduates who will be entering the medical workforce over the coming decades, hospital cost escalation may soon become a secondary problem for provincial governments.

And consideration of physician costs brings out a curious feature of the whole ABF discussion. ABF seems an attempt to stage Hamlet without the Prince of Denmark. The physician is nowhere – it is all about hospitals. ABF implicitly treats hospital utilization as if it were driven by some wholly impersonal external force – "need," perhaps. ABF, it is hoped, will improve the efficiency with which hospitals respond to these exogenously determined "needs." This is fantasy.

In fact, the physician is everywhere, defining patients' problems, admitting them to hospital and providing or directing their care.[2] If the criteria that physicians use in referring patients for ABF-reimbursed procedures expand in parallel with new capacity, the system ends up chasing its own tail. No amount of fiddling with reimbursement for hospitals will change that. For the physicians providing the ABF services, doing more means getting more resources. Overall, if you build it – or speed up throughput – they will come.

Unless the doctor is brought into the centre of the picture, ABF initiatives will risk lowering the cost of providing increased numbers of inappropriate procedures. Just how inappropriate services and procedures will be filtered out, or discouraged, has been left, for the most part, to our imagination.

In Closing

A carefully designed system of ABF for Canadian hospitals might address a number of the well-understood weaknesses of global budgeting. But it will bring its own. All systems of funding have their own perverse incentives, and the evidence is unequivocal: Morone (1986) was right. Get the incentives right, or pay the price. If you are not sure what you are doing, healthcare financing can be an expensive place to find out.

ABF reimbursement brings with it much more complex information and analytic needs than does global budgeting. To us, many provinces in Canada seem not yet ABF-ready. While the best should not be the enemy of the good, and Canadian policy makers are surely not entering into this arena with eyes wide shut, ABF for hospitals in Canada does look, at this point, rather like "Fire, aim, ready."

NOTES

1. One could be excused for wondering why physicians require extra payment to provide the sort of care that their professional training should have prepared them to provide, and that their ethical code of conduct should require.

2. It used to be said that hospitals do not have patients, they have doctors. Doctors have patients. The balance of authority may have shifted over time, but it is still a balance.

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DISCUSSION AND DEBATE

Purchasing Prescription Drugs in Canada: Hang Together or Hang Separately

L'achat de médicaments sur ordonnance au Canada : tous ensemble ou séparément

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Abstract

Canada's provincial and territorial governments have expressed an interest in bulk purchasing prescription drugs for many years. We propose they start by purchasing selected generic drugs for the entire population and provide them for little or no cost to patients. This politically popular strategy would significantly reduce drug expenditures and improve population health.

Résumé

Depuis plusieurs années, les gouvernements territoriaux et provinciaux canadiens s'intéressent à l'achat en vrac de médicaments sur ordonnance. Nous leur proposons de commencer par l'achat de certains médicaments génériques pour la population entière et de les fournir aux patients à faible prix ou sans frais. Cette stratégie politiquement populaire réduirait sensiblement les dépenses en médicaments et améliorerait la santé de la population.

* * *

PROVINCIAL PREMIERS AND TERRITORIAL LEADERS HAVE RECENTLY AGREED TO FORM a pan-Canadian purchasing alliance for prescription drugs. A purchasing alliance is tantamount to a strategy of "hanging together instead of hanging separately" in the multi-billion-dollar business of purchasing prescription drugs for Canadians. The argument that coordinated drug purchasing would reduce prices is sound, and calls for such a policy have been repeatedly echoed by prominent government commissions (Members of the National Forum on Health 1997; Romanow 2002; F/P/T Ministerial Task Force 2006). Estimates place the potential savings from bulk purchasing in the billions of dollars (Morgan et al. 2007).

Given that bulk purchasing would reduce prices, it will encounter significant resistance from pharmaceutical manufacturers, as it has when recommended in the past (Morgan et al. 2007). In light of these politics, we believe that the current effort should focus on cost-saving and health-improving purchases that would benefit patients as much as government. A program that can achieve these goals in tandem has the potential to overcome this resistance.

Specifically, governments should implement a Priority Drug Program (PDP) that would cover carefully selected drugs for the entire population at little or no cost to the patient: a first-dollar pharmacare program for specific medications. A PDP would combine coordinated bulk purchasing with coverage expansion on a class-by-class and drug-by-drug basis. By moving slowly and by starting with generic drugs, we believe the political resistance would be substantially reduced.

Cholesterol-lowering and anti-hypertensive medications are prime examples of the types of drug that should be covered under such a program. These are the most commonly dispensed drugs in Canada (IMS Health Canada 2009). They treat conditions that are among the leading causes of death in Canada (Statistics Canada 2010). And expanded coverage for the best of these drugs has been estimated to be cost-effective, even at prevailing prices (Dhalla et al. 2009). But prices of drugs covered by a PDP would fall – dramatically so.

Benefit 1: Cost Savings

Canada has amongst the highest generic drug prices in the world (Competition Bureau Canada 2007). While this factor hasn't been as important in the past, a huge number of very popular drugs have lost, or are about to lose, their patent protection. For example, the highest-selling drug in the world, the cholesterol-lowering atorvastatin (brand name Lipitor), became available as a generic last year and is now sold by more than 10 different manufacturers in Canada. Other countries leverage this breadth of suppliers to drive down prices through fierce competition for contracts. In return, suppliers are often guaranteed market exclusivity for that medicine and a particular volume of purchases (Morgan et al. 2007). The result: prices at modest mark-ups over manufacturing and distributing costs.

Instead of harnessing competition as our peers do, Canada sets generic prices at an arbitrary percentage of the equivalent brand-name drug. Changing these percentages has been highly political and contentious, such as when Ontario capped its prices at a nationwide low of 25% in 2010. However, this method of pricing ignores the fact that some generic drugs are purchased elsewhere for substantially less. For example, Ontario now pays 62.5 cents a pill for the popular cholesterol-lowering drug simvastatin (20 mg) (MOHLTC 2010). In comparison, the United States Department of Veterans Affairs (VA) pays just 3.1 cents (USDVA 2010). Similarly, while Ontario pays 20 cents for the popular antihypertensive ramipril (5 mg), the VA pays 5.3 cents (MOHLTC 2010; USDVA 2010). Compared to our international peers, even Ontario is considerably overpricing these popular drugs.

Moving to VA-level prices for just these two cardiovascular drugs would save Canadian governments tens of millions of dollars. Adding further drugs with similar price differences would save millions more. For many cardiovascular medicines, we suspect that Canadian governments could save enough through bulk purchasing to cover everyone in their provinces, give the drugs away for free and still save money. These are the drugs that the PDP should target first.

Benefit 2: Improved Population Health

Not only would a PDP save money, it would also improve health. Out-of-pocket costs for prescription drugs remain a problem for many Canadians: 18% of those with a chronic condition report not taking a drug or skipping doses because of cost (Commonwealth Fund 2008). In the case of cardiovascular medicines, fewer than half of Canadian patients adhere to therapies, including high-risk patients with established coronary disease (Jackevicius et al. 2002). One analysis found that providing free medications to patients after a heart attack in Canada would increase their life expectancy by a full year (Dhalla et al. 2009). A PDP would remove the cost barrier for a range of medications – probably the single most modifiable determinant of drug adherence (Goldman et al. 2007) – and improve health as a result.

The medical consequences of cost-related non-adherence ultimately fall upon patients who cannot afford their medicines. Ironically, the financial consequences of the expensive hospital and physician services that result fall squarely upon provincial healthcare budgets. The evidence indicates that making cardiovascular medications free for patients would improve health and reduce hospital and physician costs for expensive procedures that provinces cover in full (Choudhry et al. 2008; Dhalla et al. 2009).

Benefit 3: Politically Popular

Linking changes in the way government purchases drugs to an expansion in coverage also makes the policy change much more politically saleable. Average Canadians would rightfully see the PDP as an attempt not just to cut costs, but also to expand access to necessary medicines and reduce their increasing out-of-pocket costs. By starting with cardiovascular medicines, the benefits of lower co-payments would be immediately apparent to millions of Canadians every single time they visited a pharmacy. In the future, there are several other drug classes that could be added to the program, making the numbers that benefit even larger. As two-thirds of Canadian households have out-of-pocket expenditures on drugs every year, the benefits are likely to be widespread (Statistics Canada 2009).

In sum, our governments should use this round of bulk purchasing negotiations to provide universal, first-dollar coverage of a large selection of generic cardiovascular drugs at lower cost than they currently pay now under existing seniors-only or income-based drug plans. "Hanging together" would save costs, improve population health and mark the end to the previously unsuccessful attempts at harnessing bulk purchasing power. It's time that Canada was successful in gaining better prices for drugs, and this is the logical place to start.

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DATA MATTERS

Is Patient-Centred Care Associated with Lower Diagnostic Costs?

Les soins axés sur les patients sont-ils associés à des coûts de diagnostic moins élevés?

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Abstract

A recent report of the Health Council of Canada implies that patient-centred care is related to higher costs. This paper draws the opposite conclusion. A study of 311 family practice patients revealed that the costs for diagnostic tests decreased over four quartiles of patient-centred scores; the more patient-centred the visit, the less the cost for diagnostic testing in the two-month follow-up period. Projecting to the Canadian population, if all family physicians were patient-centred at the level of the highest quartile, one-third of these diagnostic costs would be saved. The paper makes four recommendations and concludes that patient-centred care has a role to play in delivering not only effective but also efficient healthcare services.

Résumé

Un rapport récent du Conseil canadien de la santé laisse entendre que les soins axés sur les patients sont liés à des coûts plus élevés. Le présent article tire des conclusions contraires. Une étude portant sur 311 patients en cliniques familiales indique que les coûts pour les tests de diagnostic ont diminué pour quatre quartiles des résultats; plus la consultation est axée sur le patient, moins les coûts pour les tests de diagnostic sont élevés pendant les deux mois suivants. En extrapolant ces chiffres à la population du Canada, on observe que si la pratique de tous les médecins de famille était axée sur les patients au niveau du plus haut quartile, un tiers des coûts de diagnostic seraient épargnés. L'article formule quatre recommandations et conclut que les soins axés sur les patients jouent un rôle dans la prestation de services de santé non seulement efficaces mais aussi efficients.

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A RECENT REPORT OF THE HEALTH COUNCIL OF CANADA (2010) CONCLUDES THAT family physicians' decision-making about diagnostic tests is complex. One of several drivers of decisions that the report identifies is patient-centred care, which the authors imply is related to higher costs. Our work, represented in this short paper, draws the opposite conclusion.

Patient-centred care is a high priority in Canada's healthcare system (CHSRF 2008; MOHLTC 2009). There is considerable Canadian and international evidence that patient-centred care has positive benefits for patient satisfaction (Krupat et al. 2000; Fossum and Arborelius 2004; Stewart et al. 1999), patient adherence (Stewart et al. 1999; Golin et al. 1996), patient health outcomes such as reduction of concern (Stewart et al. 2000), better self-reported health (Stewart et al. 2000, 2007) and improved physiological status (e.g., BP and HbA_{1C}) (Krupat et al. 2000; Stewart et al. 1999; Golin et al. 1996; Kaplan et al. 1989; Greenfield et al. 1988; Griffin et al. 2004; Rao et al. 2007). However, there are no comparable Canadian data to support the hypothesis that patient-centred care saves money, whereas there are US data (Epstein et al. 2005).

The Patient-Centred Outcomes Study (Stewart et al. 2000) found that patient-centred care was associated with not only improved health outcomes but also fewer diagnostic tests. This finding implied a potential for cost savings. The present-day context that both prioritizes patient-centred care and clearly requires cost constraint led us to re-analyze the Patient-Centred Outcomes Study data. We rigorously costed the medical resources associated with diagnostic tests used by the participating family physicians and patients.

There were 311 patients from the Patient-Centred Outcomes Study included in this costing analysis. The perspective for the costing was that of the provincial government's health costs. Other societal costs were not calculated. Costs of diagnostic investigations were determined for each person. First, the quantities of diagnostic tests were obtained from a chart review. The quantities were restricted to those diagnostic tests that were related to an index visit (and the associated main reason for that visit) and which occurred from the date of the index visit to two months after the index visit. Second, the price per unit of each diagnostic test was determined using Ontario Health Insurance Plan (OHIP) costing schedules from the Ministry of Health and Long-Term Care. Third, diagnostic costs were determined by multiplying the quantities by the prices per unit. We used the Patient Perception of Patient-Centredness (PPPC) questionnaire (Stewart et al. 2004) of 14 items on the extent to which the physician attended to the patient's illness experience, attended to the context of the patient and found common ground with the patient concerning problem definition and treatment/management. The analysis categorized the patient-centred scores into quartiles and determined the mean costs for each quartile.

Table 1 provides the mean diagnostic costs by the four quartiles of patient-centred care scores over the two-month follow-up period of the study. While the mean diagnostic costs for the first three quartiles were fairly similar, those for the fourth quartile were much higher, suggesting a threshold below which costs are implicated. Two possible explanations come to mind: (1) a potential statistical reason is that the fourth quartile consists of visits with a wider range of scores than the other quartiles, including some very low scores on patient-centredness, and (2) a potential clinical communication reason is that perhaps both patients and family physicians lost confidence; thus, the patient assigned low scores on the patient-centred questionnaire and the physician ordered many high-cost tests in the hope of clarifying some confusion or conflict. It should be noted that these results did not allow determination of the appropriateness of the tests ordered.

The costs in Table 1 were then projected onto the current Canadian and Ontario populations (Statistics Canada 2010) to provide a sense of the magnitude of potential cost savings as a result of patient-centred care. One-fifth of the population visits a family physician each month (Green et al. 2001). One-third of these present new symptoms for which a diagnostic test may be ordered (Stewart and Maddocks 2010). Dividing the resulting 1/15th of the population into four quartiles and calculating the diagnostic costs based on Table 1, we found that in a month $14 million would be spent in Ontario and $38 million in Canada. However, if all family physicians were patient-centred at the level of the highest quartile, potentially one-third of these costs would be saved.

The costing for this study was conducted on data from an older study, limiting our ability to draw direct comparisons to the current primary healthcare context. However, it is likely that the distribution of patient-centred scores is similar today to those found in the original; for example, a recent study using the same measure found comparable mean scores (Clayton et al. 2008). Whether family physicians' actual ordering behaviour for particular diagnostic tests might be different today than it was during the original study is more difficult to determine. However, we do know that in Canada, there was an increase between 1993/94 and 2003/04 in the number of CT tests performed (300%) and the number of MRI tests performed (600%) (You et al. 2007). This finding suggests that the potential diagnostic cost savings today may be even greater than in the earlier study.

TABLE 1. Mean diagnostic costs during the subsequent 2 months following the family physician index visit, by quartiles of patient-centred scores (n=311)*

Quartile of patient-centred score	Mean diagnostic cost
First quartile (high patient-centred scores)	$11.46
Second quartile	$13.07
Third quartile	$14.04
Fourth quartile (low patient-centred scores)	$29.48

* The table reveals the clinical significance of this finding. The statistical significance ($p=0.004$) was assessed using a multiple regression of the dependent continuous outcome of diagnostic cost with patient-centred scores as the continuous independent variable, controlling for the variables found significant in the bivariate analysis (patient's main presenting problem and marital status).

Other Canadian research has demonstrated that it is possible to provide better primary care that is associated with lower costs (Hollander et al. 2009). Our intention in reporting these results is to encourage further dialogue and future research on the association between patient-centred primary care and costs in today's healthcare context.

These results lead to several modest recommendations. First, future studies could evaluate the costs as one of the potential benefits of a patient-centred approach. Second, the College of Family Physicians of Canada could strengthen its emphasis on the education and evaluation of patient-centred care given that training for patient-centred care has been shown to be effective (Stewart et al. 2007). Third, one could study whether incentives given to family physicians could improve their patient-centred care. Fourth, patients in primary care could be surveyed to assess their perceptions of patient-centred care to provide feedback to family physicians (Reinders et al. 2010). These four recommendations imply future directions for research, education, policy and practice in improving patient-centred care. Patient-centred care has a role to play in delivering not only effective but also efficient healthcare services.

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COMMENTARY

Family Doctors and Lower Diagnostic Imaging Costs: How Do We Get There from Here?

Médecins de famille et coûts d'imagerie diagnostique moins élevés : comment peut-on y arriver?

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Moira Stewart and colleagues present a promising new analysis of their data indicating that patient-centred care may contribute to lower diagnostic imaging costs, at least according to available data on practice patterns and costs in Ontario. If this positive outcome holds true, the question then is: what needs to be done to ensure that more of Canada's family doctors are able and encouraged to practise patient-centred care?

The Health Council of Canada's report, *Decisions, Decisions: Family Doctors as Gatekeepers to Prescription Drugs and Diagnostic Imaging in Canada* (September 2010), was intended to open the door to discussion and debate about the increasingly important but under-recognized role of family physicians as gatekeepers to pharmaceutical drugs and diagnostic imaging, two drivers of increased healthcare spending. Although we did not examine practice patterns and costs through the lens of patient-centredness of care, we can certainly agree with the authors' recommendations (and make similar recommendations ourselves) that better data and more research are needed to understand the relationships between approaches to care, compensation or incentives, system utilization, patient outcomes and costs.

Although we did not set out to reach conclusions related to patient-centred care, based on our findings, we would suggest that it is not patient-centred care in itself that results in higher costs. Rather, owing to the complex environment within which family physicians play their gatekeeping role, there are impediments to providing patient-centred care to the fullest extent, and it is these impediments that are contributing to rising costs.

Stewart and her colleagues note that use of diagnostic testing has increased since 2000. Indeed, the most recent data show that between 1990 and 2009, the number of CT scanners in Canada more than doubled, while MRI scanners increased more than tenfold. Accordingly, in 2009, Canadians received more than four million CT exams and nearly 1.4 million MRI exams – a 58% increase in CT exams and a 100% increase in MRI exams compared to 2003 (Health Council of Canada 2010). Higher costs related to diagnostic imaging over the past 10 years have been directly linked to increased access to scans throughout Canada. As costs and access have increased, concerns have been raised regarding overuse and inappropriate ordering. According to the Canadian Association of Radiologists (2009), as many as 30% of CT scans and other imaging procedures are inappropriate or contribute no useful information. While Stewart and colleagues acknowledge that they did not factor appropriateness into their analysis, the Health Council feels that appropriateness is a key consideration that must be factored into discussions associated with physicians' practice and costs, and impact on patient-centred care.

There is no doubt that for family doctors, their patients' health and safety are the primary focus of decision-making. We know that the factors that family physicians take into consideration when making treatment recommendations – a decision to order a diagnostic test, prescribe a drug, refer to a specialist or follow another course of action – are numerous and complex. They include the physician's initial medical training and efforts to stay on top of current research, the availability of new technologies, the desire to meet patients' expectations and the doctor's overall clinical judgment. We expect that models of physician compensation, including performance incentives, also play a role.

So why are physicians ordering unnecessary tests? And how does this practice relate to patient-centred care?

Based on our review of the literature and expert advice from physician and radiologist leaders in Canada, we found that inappropriate ordering is a consequence of pressures put on referring physicians by patients and by an ever-increasing workload. Physicians are ordering tests in an environment that is rapidly changing. Standards for best practice for diagnostic imaging are constantly being updated, and decision support tools to aid family physicians are limited or not easily accessible. We also found that liability and malpractice concerns may drive physicians to order more tests than needed. This environment is not conducive to patient-centred care.

In addition to the complex decision-making environment, physicians are making decisions in a practice environment that is different from 10 and even five years ago. Canada's move to primary care teams and alternative funding models that would ideally allow physicians to fully explore and take patients' desires, beliefs and capabilities into consideration – important elements of patient-centred care. Currently, however, we are quite limited in terms of data or evidence to show where we are in terms of the impact of primary care reform on patient-centred care.

According to the 2007 National Physician Survey, Canadian family physicians spend roughly two-thirds of their time on direct patient care. The remainder is spent on managing their practice, participating in research projects, teaching and continuing medical education. These multiple demands are squeezing the amount of time doctors spend with patients, which one Ontario study found to be roughly 10 to 15 minutes per visit (Russell et al. 2009). These time pressures are not conducive to patient-centred care.

Patient-centred care may indeed be associated with lower diagnostic costs, but until family physicians are able to practice in environments that optimize this type of care, we will not be able to measure the true impact on outcomes and costs at the system level, let alone for specific procedures.

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RESEARCH PAPER

Is It Worthwhile to Invest in Home Care?

Vaut-il la peine d'investir dans les soins à domicile?

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Abstract

The objective of this study was to estimate the impact of the First Nations and Inuit Home and Community Care Program (FNIHCCP) on the rates of hospitalization for ambulatory care sensitive conditions (ACSCs) in the province of Manitoba. A population-based time trend analysis was conducted using the de-identified administrative data housed at the Manitoba Centre for Health Policy, including data from 1984/85 to 2004/05. Findings show a significant decline in the rates of hospitalization (all conditions) following the introduction of the

FNIHCCP in communities served by health offices ($p<0.0001$), health centres ($p<0.0001$) and nursing stations ($p=0.0022$). Communities served by health offices or health centres also experienced a significant reduction in rates of hospitalization for chronic conditions ($p<0.0001$).

The results of this study suggest that investment in home care resulted in a significant decline in rates of avoidable hospitalization, especially in communities that otherwise had limited access to primary healthcare.

Résumé

Cette étude visait à estimer l'impact du Programme de soins à domicile et en milieu communautaire des Premières nations et des Inuits (PSDMCPNI) sur les taux d'hospitalisations liées à des conditions propices au traitement ambulatoire dans la province du Manitoba. Nous avons procédé à une analyse évolutive des tendances, fondée sur la population, à partir de données administratives anonymes recueillies par le Centre des politiques de santé du Manitoba, notamment celles de la période entre 1984-1985 et 2004-2005.

Les résultats indiquent un déclin significatif des taux d'hospitalisations (pour tous les états de santé) suite à la mise en place du PSDMCPNI dans les communautés desservies par les offices de la santé ($p<0,0001$), les centres de santé ($p<0,0001$) et les postes infirmiers ($p=0,0022$). Les communautés desservies par les offices ou les centres de santé ont également connu une réduction substantielle des taux d'hospitalisations pour les états chroniques ($p<0,0001$).

Les résultats de cette étude indiquent que l'investissement dans les soins à domicile a mené à un déclin significatif des taux d'hospitalisations évitables, particulièrement dans les communautés qui ont un accès limité aux soins de santé primaires.

* * *

Many studies have documented that First Nations experience a disproportionate burden of chronic diseases (CIHI 2004; First Nations Regional Health Survey National Committee 2005; Dyck 2001). The upward trend reported among the Canadian population (Canadian Healthcare Association 2009) is also evident, and will result in increased rates of hospitalization.

Recognizing this and following trends in all Canadian provinces, the First Nations and Inuit Health Branch (FNIHB) of Health Canada launched the First Nations and Inuit Home and Community Care Program (FNIHCCP) in 1999, its single most comprehensive new program to date. Investments totalled $152 million in the first three years of implementation, with an ongoing commitment of $90 million (Consilium Consulting Group 2006).

The objective of this study was to assess the impact, if any, of the FNIHCCP on the rates of hospitalization for ambulatory care sensitive conditions (ACSCs) in the province of Manitoba, Canada. The study is timely. While there seems to be broad consensus that home care services should become the next essential service to be covered under the *Canada Health Act* (Canadian Healthcare Association 2009; Kirby 2002; Romanow 2002; Tsasis 2009), we have been unable to locate solid evidence that investments in home care might result in a reduction in avoidable hospitalizations and savings associated with such a reduction.

This study is part of a larger study that investigated the relationship between models of community control, on-reserve access to primary healthcare services and health outcomes among First Nations people living in the province of Manitoba (Lavoie et al. 2010). Manitoba was selected for this study because, along with Saskatchewan, Manitoba is home to the highest proportion of First Nations people in Canada, at nearly 10% of the provincial population (Statistics Canada 2008). Second, Manitoba is unique in Canada and among other countries in that collaborations exist between the Assembly of Manitoba Chiefs, which represents First Nations, and the Manitoba Centre for Health Policy of the University of Manitoba, which houses the Population Health Research Data Repository ("the Repository"), consisting of provincial administrative databases that are longitudinal, de-identified yet linkable at the individual level. The Repository facilitates health research in areas that are of relevance to First Nations. Finally, this study was identified as a high-priority research area by the Assembly of Manitoba Chiefs.

Conceptual Framework

In this study, we are concerned with health needs that can be addressed through community-based primary healthcare intervention, including home care interventions. In this paper, we locate home care interventions within the primary healthcare continuum (Table 1). Home care includes secondary and tertiary prevention activities, as well as a spectrum of primary care interventions delivered in the home for the purpose of protecting and maintaining the autonomy of those living with chronic conditions.

TABLE 1. Healthcare framework

Category & subcategory		Definition	Example
Primary healthcare	Primary care	Outpatient treatment traditionally provided by general practitioners and, more recently, by nurse practitioners	Prescription, wound dressing
	Tertiary prevention	Activities designed to assist in the management of complications once they manifest, to ensure that optimal autonomy is retained	Physical rehabilitation support after an amputation
	Secondary prevention	Activities focused on assisting in the management of chronic illness to avoid or delay the development of complications	Blood sugar monitoring and foot care
	Primary prevention	Early interventions designed to prevent the onset of chronic conditions	Education

Source: Adapted by Lavoie from Starfield 1996.

Although the exact role that primary healthcare can play in addressing health inequalities is limited (Marmot and Wilkinson 1999), reviews by Starfield and colleagues (2005) and

Macinko and colleagues (2003) suggest that better access to primary care and primary prevention (these are the terms used by these authors, which when taken together roughly equate to primary healthcare) is associated with improved access to immunization; smoking cessation; better prenatal outcomes; decreased childhood morbidity; earlier detection of melanoma and breast, colon and cervical cancers; improved outcomes for patients with type 2 diabetes mellitus, hypertension and depression; improved management of asthma; and decreased all-cause mortality. As well, research at MCHP has shown that continuity of physician care is related to improved uptake of mammography and cervical cancer screening, higher rates of childhood immunization and lower rates of lower-limb amputations for people with diabetes (Martens and Fransoo 2008).

For the purpose of this study, we have defined outcomes in terms of hospitalization for ambulatory care sensitive conditions. These conditions are defined as "[t]hose diagnoses for which timely and effective outpatient [primary] care can help to reduce the risks of hospitalization by either preventing the onset of an illness or conditions, controlling an acute episodic illness or conditions, or managing a chronic disease or condition" (Billings et al. 1993).

Hospitalizations for ACSC diagnoses may therefore indicate a potentially preventable complication resulting from limited access to responsive primary healthcare services. Further, a disproportionate rate of hospitalization for ACSCs among First Nations people, when compared to other Manitobans, suggests possible inequity in access to primary healthcare (Martens et al. 2005) and the need for investment. This indicator has been endorsed by researchers and policy makers as a dependable indicator of the performance of primary healthcare services (CIHI 2006, 2007; Marshall et al. 2004).

Local access to care

In the First Nations context, on-reserve primary healthcare services are funded and were historically delivered by the First Nations and Inuit Health Branch of Health Canada. Broadly speaking, the current complement of on-reserve health services is based on a 1969 study (Booz Allen and Hamilton Canada 1969) that recommended a greater focus on prevention, among other factors. However, this study's recommendations were nested in a federal policy that saw the responsibility of the federal government as complementary to the services that were available from provincial governments. What emerged is a four-level framework that constitutes the basis of FNIHB funding for on-reserve health services, based on community size, level of remoteness and access to provincial services (Table 2). This categorization is generally termed *facility designation*.

Communities considered to have reasonable access to provincial healthcare services in nearby communities are funded to offer screening and preventive services (health offices). Communities located within a two-hour drive from provincial services are funded to ensure local access to preventive, screening and emergency care. These services, delivered through health centres, focus on primary prevention, with some level of secondary prevention interventions. There is no or limited funding to ensure off-hours coverage. More isolated communities served by nursing stations are funded to ensure local access to screening, prevention, emergency and treatment services on a 24/7 basis, delivered by nurses with an extended scope of practice.

Previous work by Martens and colleagues (2005) documented that diabetes prevalence is 4.2 times higher for Manitoba First Nations people compared to all other Manitobans (18.9% versus 4.54%), but the population rate of amputation due to diabetes is 16 times higher (3.1 versus 0.19 per thousand, ages 20 through 79). The study reported the highest rate of amputations (6.2 per thousand) in communities located in the southwest of the province. Although there is some variation, these communities are considered non-isolated (meaning that a general practitioner, a hospital or both are available within 60 kilometres, and that roads are passable all year) and are served by either a health office (N=5) or a health centre (N=4). These findings suggest that geographical accessibility does not guarantee that services can be accessed, are accessed or are responsive. These findings provide an impetus to look more carefully at the relationship between local access to care and outcomes.

In 1999, FNIHB rolled out the First Nations and Inuit Home and Community Care Program (FNIHCCP) in response to a national shift towards home care implemented in all provinces, which resulted in hospitals adopting early discharge of patients. This program was the most significant financial and program investment made by FNIHB in First Nations communities, and resulted in the expansion of secondary prevention activities for those living with chronic conditions (Health Canada FNIHB 2004c). It was made accessible to all First Nations communities as of 1999, with the exception of those communities receiving care from regional health authorities (i.e., no facilities in the community), under a 1964 agreement on jurisdictional issues between levels of health governance (FNIHB and Manitoba Health). Those communities can, at least theoretically, access home care from their RHA.

Home care services on reserves

The planning and development of the FNIHCCP was supported by a high-level advisory committee composed of federal, First Nations and Inuit partners. Unlike other programs rolled out in the past, the FNIHCCP was rolled out in a highly structured manner, with communities expected to complete a multistage program planning process, including completion of a community needs assessment, followed by the development of a service delivery plan, a training plan and a capital plan. As defined by FNIHB, key features of the program included on-reserve structured client needs assessments, managed care, access to home care nursing, access to in-home respite care and linkages with existing on- and off-reserve health and social services (Consilium Consulting Group 2006). These interventions can be defined as primary care (delivered by nurses where there are nursing stations), and secondary and tertiary prevention. As of September 2003, 96% of eligible communities were being funded by the program (Health Canada FNIHB 2004b), including all Manitoba First Nations communities, with the exception of those served by RHAs.

Methods

Data and sample

The sample for this research project includes all Manitoba residents eligible under the Manitoba Health Services Insurance Plan living on First Nations reserves (N=64,929 in 1984/85; N=71,510 in 2004/05). One conceptual impediment to pursuing this work to date has been that researchers have focused on ethnicity rather than residency in a community as the key independent variable. The current databases are unable to show First Nations identification reliably. This study, however, does not require First Nations identification because it is concerned with services accessible to community members, and theorizes that service availability is constrained by federal–provincial jurisdictional division of responsibilities over First Nations primary healthcare services, the level of on-reserve primary healthcare services funded and geography (Canada First Nations and Inuit Regional Health Survey National Steering Committee 2005).

We used six-digit postal code data in the administrative database to track all Manitobans to their home address to identify the population served by each community. Manitoba-registered First Nations represent 95.6% of the overall on-reserve population (Community Workload Increase System 2003/04 figures from FNIHB, Lavoie and Forget 2005). Others are non-status, Métis or non-Indigenous individuals who depend on the same services. In this study, only four communities (Dakota Plains, Dauphin River, Lake St. Martin and Long Plains, with a total population of approximately 2,000 individuals) could not be uniquely identified by postal code and thus could not be included in the sample. Table 3 provides a breakdown of communities per category. We estimate the impact of this omission to be negligible.

TABLE 3. Description of the sample

	Number of communities		Total population included	
	1984–85	2004–05	1984–85	2004–05
Level of primary healthcare available on reserve				
No facility	2	2	2,627	1,031
Health office	24	24	22,631	19,225
Health centre	11	11	18,542	22,933
Nursing station	22	22	21,129	28,321
	59	59	64,929	71,510

Trends and patterns of health services used by residents living on First Nations reserves were identified from fiscal years 1984/85 to 2004/05 to assess the potential impact of community control and access to local primary healthcare services over time. The data used for this study included files held at the Repository housed at the Manitoba Centre for Health Policy, namely: (1) Vital Statistics files, (2) the Population Health Registry file for the provincial insured population and (3) the hospital record files. The Population Health Registry file provides demographic information such as sex, age and place of residence (a six-digit postal code), but is de-identified (i.e., no name, no complete address). A (new) family number is assigned when a resident becomes 18 years of age, is married or divorced. One of the divorced spouses, typically the woman, receives a new number. Tracking family numbers provides information on family composition. This population-based registry provides information on all residents in a given postal code, as well as their arrival and departures (births, deaths and moves) for any date since 1970 (Roos and Nicol 1999). Time-sensitive data (place of residence, family composition) are updated every six months. Longitudinal or linked data are typically put together as needed for each study. Each substantive file can be checked against the registry for accuracy of the identifiers and particular information, for example, date of in-hospital death (Roos et al. 2003).

Standardized data, based on every hospital contact, are submitted to Manitoba Health, the provincial agency responsible for funding. This information (including de-identified patient identifiers, physician claims, diagnoses, costs, hospitalization and institutionalization data) is part of a system maintained and controlled by Manitoba Health, and is accessible in a de-identified form via the Repository. This system allows tracking resource utilization over time for any given patient or particular medical diagnosis, including all hospitalization data.

Measures

DEPENDENT VARIABLE

The key dependent variable is hospitalization for an ACSC. For this study, we developed our own definition of ACSC. We began with a definition created by the Canadian Institute Health Information (2006, 2007), which is focused on an aging population. We added components from the Victorian Government of Australia, whose definition is more comprehensive (Victorian Government Department of Human Resources Division 2001). Finally, we fine-tuned our definition using recent studies related to the epidemiological profile of First Nations people in Manitoba and in Canada (Martens et al. 2002, 2005; Shah et al. 2003). Our final definition includes three categories of ACSCs: chronic, vaccine-preventable and acute conditions, as listed in Table 4. Each condition was defined based on the International Classification of Diseases. The 1984/85 to 2003/04 hospital data use the ICD-9-CM codes; the 2004/05 data use the ICD-10-CA codes. We used three-, four- and five-digit codes, depending on the condition.

INDEPENDENT VARIABLES

Two key independent variables were identified. The first focuses on the introduction of the FNIHCCP in 1999. The second is related to local access to primary healthcare. For this variable, we developed a database of First Nations communities in Manitoba that shows the level of care classifications outlined in Table 2. Accordingly, only 22 First Nations communities in Manitoba are resourced to offer a full complement of primary healthcare services (nursing stations). The remaining 35 are resourced for public health programs five days a week or less, that focus largely on primary prevention (education) and screening. In these communities, services to those individuals who have already been diagnosed with a chronic condition are extremely limited. Our sample includes an additional two communities that have no local access to services.

TABLE 4. Definition of ambulatory care sensitive conditions

Conditions	Codes
Chronic conditions	Acute Bronchitis (only when a secondary diagnosis* of COPD is present); Asthma; Angina; Chronic Obstructive Pulmonary Disease (COPD); Diabetes, Diabetes with Complications; Grand Mal Status and other epileptic convulsions; Heart Failure and Pulmonary Edema; Hypertension (excluding cases with the following surgical procedures**); Iron Deficiency Anaemia, Other Deficiency Anaemia; Pneumonia (only when a secondary diagnosis* of COPD is present)
Vaccine-preventable conditions	Diphtheria; Haemophilus Influenza type B; Hepatitis A; Hepatitis B; Influenza; Measles; Meningococcal Disease (meningitis); Mumps; Pertussis; Pneumococcal Disease; Poliomyelitis; Rubella; Tetanus; Tuberculosis
Acute conditions	Cellulitis (excluding cases with the following surgical procedures except incision of skin and subcutaneous tissue where it is the only listed cause); Dental Conditions; Gastroenteritis; Pelvic Inflammatory Disease (excluding males or cases with a hysterectomy procedure); Severe ENT (Ear, Nose, Throat) Infections (excluding otitis media cases with a myringotomy procedure)

* "Secondary diagnosis" refers to a diagnosis other than most responsible.
** Code may be recorded in any position. Procedures coded as cancelled, previous and "abandoned after onset" were excluded.
Source: CIHI 2006, 2007; Victorian Government Department of Human Resources Division, 2001.

Statistical method

A model-based approach using the generalized estimating equations (GEE) method of parameter estimation was applied to these data to test for differences in hospital utilization rates for ACSCs. Generalized estimating equations are used as a method for analyzing correlated longitudinal data. These data have measurements (hospitalizations) taken over time (1984/85–2004/05) on subjects that share common characteristics (age group, gender and community). Therefore, one may expect the outcomes for subjects of similar age, gender and community to be correlated over time. The GEE method takes into account the correlated structure of the data and permits valid hypothesis-testing results.

Results

As shown in Figure 1, the rates of hospitalization for ACSCs have been declining over the past two decades in Manitoba, rural Manitoba and for individuals living on Manitoba First Nations reserves. To assess the potential impact of the FNIHCCP, we aggregated three years' worth of data for three separate time periods: 1989/92 was used as an overall baseline, the 1996/99 period was used as a FNIHCCP-specific baseline and 2002/05 was used as the post-intervention comparison.

FIGURE 1. Adjusted rates per 1,000 population of hospitalization for ACSCs over time

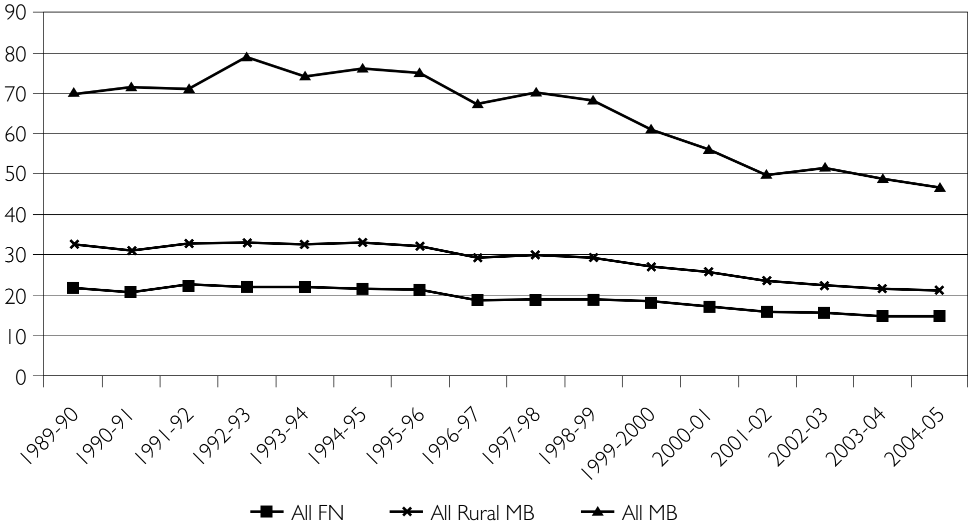
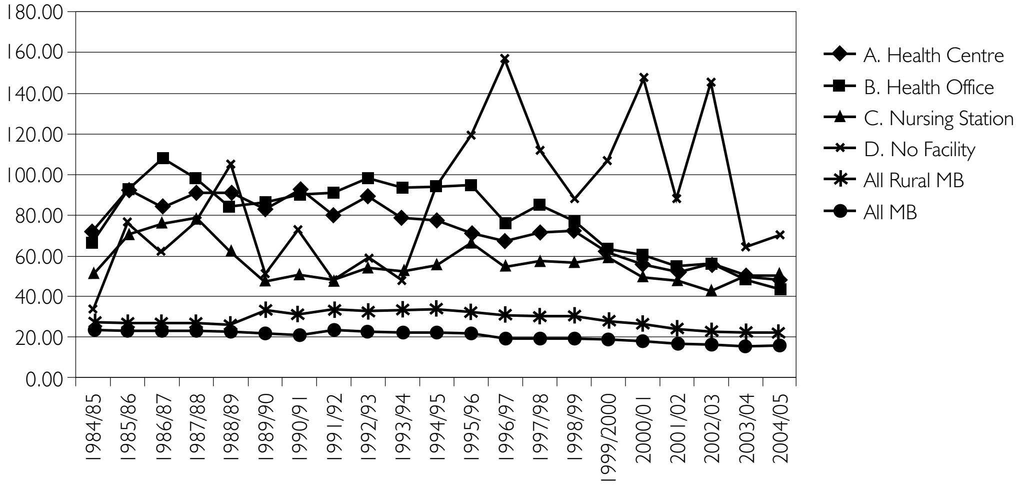


FIGURE 2. Adjusted ACSC rates per 1,000 population by facility type



As shown in Table 5 and Figure 2, the rates of hospitalization for ACSCs steadily declined between 1989/92 and 2002/05 in all Manitoba communities and in Manitoba rural communities (First Nations communities excluded). In First Nations communities served by no facility, however, the rates of hospitalizations for ACSCs (all conditions) actually increased ($p<0.0001$) between 1989/92 in communities where individuals requiring care presumably accessed care outside the reserve in provincial facilities. There was no statistically significant difference for the 1996/99 to 2002/05 period for all conditions, although a significant decline in the rates for chronic conditions was noted ($p=0.0409$). Thus, the gains achieved in other Manitoba communities were not reflected in First Nations communities with no local access to care.

TABLE 5. Relationship between the level of local access to primary healthcare (facility designation) and rates of hospitalization for ACSCs before and after introduction of the FNIHCCP

Avg. diff. in rates	ACSC	Time period	Mean estimate	Mean confidence limits		Chi-square	Pr > ChiSq
No facility	All conditions	1989/92 and 1996/99	0.4699	0.3281	0.6728	17	<0.0001
		1996/99 and 2002/05	1.3436	0.894	2.0194	2.02	0.1553
	Chronic conditions only	1989/92 and 1996/99	0.5425	0.2760	1.0666	3.14	0.0762
		1996/99 and 2002/05	2.0025	1.0292	3.8961	4.18	0.0409
Health office	All conditions	1989/92 and 1996/99	1.1232	1.0202	1.2365	5.61	0.0179
		1996/99 and 2002/05	1.6027	1.4531	1.7678	88.93	<0.0001
	Chronic conditions only	1989/92 and 1996/99	0.9879	0.8620	1.1322	0.03	0.8610
		1996/99 and 2002/05	1.5811	1.3610	1.8367	35.90	<0.0001
Health centre	All conditions	1989/92 and 1996/99	1.2058	1.0844	1.3408	11.95	0.0005
		1996/99 and 2002/05	1.3621	1.2205	1.5202	30.45	<0.0001
	Chronic conditions only	1989/92 and 1996/99	1.1600	0.9846	1.3666	3.15	0.0760
		1996/99 and 2002/05	1.3757	1.1781	1.6098	16.28	<0.0001
Nursing station	All conditions	1989/92 and 1996/99	0.8789	0.7862	0.9825	5.15	0.0232
		1996/99 and 2002/05	1.1744	1.0593	1.302	9.33	0.0022
	Chronic conditions only	1989/92 and 1996/99	0.9275	0.7637	1.1265	0.58	0.4480
		1996/99 and 2002/05	1.1477	0.9526	1.3827	2.10	0.1473
All Manitoba rural communities	All conditions	1989/92 and 1996/99	1.0862	1.0246	1.1514	7.71	0.0055
		1996/99 and 2002/05	1.3561	1.292	1.4233	152.11	<0.0001
	Chronic conditions only	1989/92 and 1996/99	1.1211	1.0395	1.2090	8.80	0.0030
		1996/99 and 2002/05	1.3634	1.2673	1.4668	69.06	<0.0001
All Manitoba	All conditions	1989/92 and 1996/99	1.1333	1.0701	1.2001	18.31	<0.0001
		1996/99 and 2002/05	1.2537	1.2026	1.3069	113.5	<0.0001
	Chronic conditions only	1989/92 and 1996/99	1.2310	1.1423	1.3265	29.70	<0.0001
		1996/99 and 2002/05	1.2287	1.1552	1.3068	42.89	<0.0001

Communities served by a health office showed a decline in the rates of hospitalizations for ACSCs (all conditions, $p=0.0179$) between 1989/92 and 1996/99. This was not the case for chronic conditions. Following the introduction of the FNIHCCP, rates of hospitalizations for ACSCs fell, for all conditions and chronic conditions ($p<0.0001$). A similar pattern also took place in communities served by health centres. In communities served by nursing stations, the rates of hospitalization for all conditions were on the increase between 1989/92 and 1996/99 (all conditions, $p=0.0232$). Following the introduction of the FNIHCCP, the rates of hospitalization for all conditions dropped ($p<0.001$). Results for chronic conditions were not statistically significant.

Discussion

This study sought to document the relationship between local access to primary healthcare and the rates of hospitalization for ACSCs among First Nations people living on reserves in the province of Manitoba, Canada. We acknowledge a number of limitations to this study.

First, we used locality (postal codes) as opposed to ethnicity to identify First Nations. As a result, it is likely that some non-Indigenous individuals living on reserves (employees, partners), and some First Nations and non-Indigenous individuals living close to the reserve, were included in the sample. Because this study is focused on the impact of local access to care, we see this broader inclusion as acceptable. Many of these communities are remote and relatively isolated. Further, it is generally the case that First Nations people living close to a reserve will seek care on the reserve. Because access to care is constrained by geography, it is reasonable to assume that barriers to accessing care are shared by those who live near the reserve.

A second limitation is related to the size of our sample and the size of the communities, which prevented us from undertaking condition-specific analyses. Such analyses would have allowed us to look for condition-specific response time, as well as condition-specific service gaps. We are currently pursuing discussions in order to replicate this study in other provinces. While replication may provide opportunities to increase the sample size, it will also create challenges related to data comparability.

A third limitation is that, following Caminal and colleagues (2004), we chose to develop our own definition of ACSC, to match the epidemiological profile of First Nations. This choice will limit the comparability of our results to other studies. While this is a limitation, our purpose was to document the impact of a policy option on health outcomes, to complement other studies that compared the prevalence of health conditions and the disproportionate rates of avoidable hospitalization among Manitoba First Nations compared to the Canadian and Manitoba populations (Martens et al. 2002, 2005, 2007).

The final major limitation is the fact that this study is observational, and thus our results show association, not causation, which cannot be assumed. Further, we cannot disentangle the impact of the FNIHCCP from that of other interventions. That being said, the data used for this study include all people living in First Nations communities. Further, this comparative time trend analysis, with rural Manitoba being a comparison group, demonstrates that the decline in ACSCs experienced in other communities did not occur until the FNIHCCP was introduced. Still, we acknowledge that communities are diverse, and that other factors may have influenced our results.

Conclusion

This study documented that in the years prior to the implementation of the First Nations and Inuit Home and Community Care Program, communities served by health offices and health centres had limited access to primary healthcare. The introduction of the FNIHCCP expanded primary healthcare activities in those communities. It appears that these activities had a positive impact on rates of hospitalization for ACSCs. This is true for all ACSC conditions and for chronic conditions.

Communities served by nursing stations showed decreases in rates of hospitalization for ACSCs for all conditions. The same gains were not documented for chronic conditions, however. This finding is somewhat puzzling, and may be explained by the fact that communities served by nursing stations have local access to a broad complement of primary healthcare services. We postulate that the FNIHCCP did not have the same impact on chronic conditions as it did in other communities, because access to key services was already available. The program did, however, have an impact on rates of hospitalization for all conditions, suggesting that expanding human resources in primary healthcare was needed.

Finally, this study documented that in First Nations communities where access to the FNIHCCP was not available, the gains reported above were not experienced. Although more work is required to explain these results, they suggest that the FNIHCCP may have had an important impact.

This study is a first attempt at quantifying health outcomes evidence in relationship to the FNIHCCP. Our results show that this investment resulted in improved outcomes, and in a shift to utilization of home care services rather than hospital care. At the national level, our findings suggest that investments in home care services result in improved efficiency in the healthcare system, thereby bringing evidence to current interests in expanding services insurable under the 1984 *Canada Health Act* to include home care services.

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RESEARCH PAPER

Canadian Political Science and Medicare: Six Decades of Inquiry

Science politique et assurance maladie au Canada : soixante ans d'enquête

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Abstract

Based on an extensive sample of the literature, this critical review dissects the principal themes that have animated the Canadian political science profession on the topic of medicare. The review considers the coincidence of economic eras and how these are reflected in the methodological approaches to the study of medicare. As is to be expected, most of the scholarly activity coincides with the economic era marked by fiscal restraint and decreases in social investments (1993–2003). At the same time, the review notes the prevalence of institutionalism as an approach to the topic and the scholarly community's near-consensus on medicare as a defining characteristic of the country and its people.

Résumé

Cette revue critique, fondée sur un vaste échantillon de la littérature, examine les principaux thèmes qui ont stimulé la science politique au Canada en matière d'assurance maladie. La revue tient compte de la coïncidence des périodes économiques et de la façon dont elles sont reflétées dans les démarches méthodologiques pour l'étude de l'assurance maladie. Tel que pressenti, la plupart des activités des chercheurs coïncident avec la période économique marquée par les restrictions budgétaires et les coupures dans l'investissement social (1993-2003). Parallèlement, la revue indique la prévalence de l'institutionnalisme comme démarche adoptée pour ce sujet. Elle indique également la présence d'un quasi consensus du milieu de la recherche, lequel voit l'assurance maladie comme une caractéristique qui définit le pays et ses habitants.

THERE ARE FEW ISSUES OF MORE CONCERN TO CANADIANS THAN THE STATE OF their public healthcare system, or medicare. As Soroka (2007: 5) notes in a recent and comprehensive study of Canadian public opinion on this topic: "for many Canadians, publicly funded universal health care is one of the foremost policy features of the Canadian state." Some analysts have gone further and argued that this attachment is so strong that it deflects attempts to downsize or significantly alter the shape and scope of medicare (O'Neill 1996). Although medicare is an issue with high political salience, there has been limited work in the social sciences to define health policy studies (see Abelson et al. 2008), and no one has attempted a holistic view of the political science profession's contribution to the study of medicare per se.

This paper provides an overview of the content of peer-reviewed papers written by Canadian political scientists on the topic of medicare. The conclusions drawn as a result of this literature review will highlight the preferences of the discipline in terms of its research methodology and approaches to the study of medicare. At the same time, it points to some of the salient issues raised in the literature over the six decades of inquiry we have considered. Some of our findings may be intuitive to students of Canadian politics, such as the profession's preference for normative research as opposed to theory and modelling. However, we also propose newer findings, such as the prevalence of institutionalism over these six decades, which may shed further light on the general scholarship of the Canadian discipline. In undertaking this literature review, we find inspiration in Richard Simeon's (2002) previous work and the conclusions he drew about the Canadian academy.

This paper contributes principally to the field of political science, although we believe it will be of interest to scholars from other fields who share an interest in medicare or health insurance systems in general. If we accept that medicare is "a touchstone of [Canadian] citizen identification" (Boychuk 2008: 141) and that the interests of the academy and the public (including the elite public) should coincide, then we should see evidence of this in the published output of the Canadian political science profession.

This paper will also be of interest to health policy analysts and others directly involved in the development and management of Canada's health insurance system. The paper achieves this by informing the discussion about medicare through the prism of a social science that studies governments, public policies, political processes and systems, and political behaviour. We believe that a better understanding of these forces and actors can assist in developing public policy tools, in the analysis of past public policy decisions and in lesson drawing to aid future policy development.

Medicare-related articles by Canadian political scientists: 1946–2006

Much of the Canadian academic literature on medicare has leaned heavily towards the economic approach. Typical of this is Robert G. Evans, who has written over 40 books and many more papers on the subject of medicare. However, as political scientists, our interest lay in the research output of our peers. To do so, we chose to focus on the research output of the Canadian community of political scientists between 1946 and 2006 through a comparative and content analysis of the papers published in Canadian and specialty health politics journals. In doing so, we acknowledge that our discussion concerning the final period we examined (2003–2006) is limited given that it considers only three years of scholarly activity and, therefore, cannot be fully compared to preceding periods that are much longer.

The decision to concentrate only on peer-reviewed papers rather than books was not without consequence; by focusing on papers, we were able to include a large number of writings by Canadian political scientists in our analysis and review. The representativeness of these papers was confirmed through a review of scholarly citation indexes and research library catalogues. We accept, however, that this approach is not without limitations, for it also meant that seminal books on the topic of medicare were not captured in this review. However, this limitation is largely mitigated by the inclusion of papers that reflect the writings of political scientists in other forms, such as we propose is the case for Malcolm Taylor (1960, 1972, 2009). Furthermore, we believe that choosing to focus on papers is consistent with our purpose of painting a picture of a scholarly field's contribution on medicare.

The criteria applied to select the papers, though imperfect, allowed us to focus on a significant segment of the Canadian political science profession. For the purposes of this review, institutional affiliation was used as a proxy for nationality. While we recognize that this eliminates papers written by Canadians in institutions outside Canada (and includes non-Canadians researching in Canadian institutions), on the whole we contend that this approach provides a more catholic understanding of the community of scholars whose work we were interested in studying. Moreover, taking inspiration from Cameron and Krikorian (2002), we contend that as the papers selected for review were published in leading Canadian and health politics and policy journals, these reflect the dominant trends and patterns in the Canadian discipline over the period under review.

Second, we opted not to overly subdivide the profession. In this study, political science is broadly defined and includes the field of public administration. Note that we purposely excluded from the analysis studies made by non–political scientists that use the methods of political science (or were published in policy or public administration journals). This is not to negate the important contribution made by these fields, but merely to circumscribe the analysis to the core research unit (Canadian political scientists).

Relying on a combination of keywords (e.g., Canada, medicare, health insurance) and the criteria noted above, commercial databases (JSTOR, PAIS, Social Sciences Abstracts and Sage's Political Science) were used to find the papers. This approach elicited a list of 44 papers, which we further pared down using citation indexes in order to focus on the papers with the greatest impact within the discipline. Twenty-seven papers were retained as exemplars of Canadian scholarship on the topic of medicare, and these are the object of the analysis reported below.

In undertaking this review, our objectives were twofold: first, to determine whether and why scholarly attention to medicare ebbed and flowed over time. Second, after Simeon (2002), we were interested in finding out whether one school or approach was dominant in the study of medicare or whether a number of approaches competed in the discipline.

In undertaking our analysis we drew upon Howlett and Ramesh (2003) and Simeon (2002). Howlett and Ramesh inspired the method of analysis that considered different possible combinations of units, method and levels of analysis. Simeon inspired a review that considered the three dominant models that have marked Canadian political science: political culture, political economy and institutionalism (Simeon 2002: 32–39).

Six Decades of Inquiry

The Canadian welfare state, and medicare in particular, did not develop in isolation from the broader economic and social contexts. This view is admirably captured in the title of Malcolm Taylor's classic 1978 study (Taylor 2009). Recognizing this, we grouped the papers we reviewed according to economic and social eras. These eras are understood to mean periods marked by (1) policies aimed at regulating or deregulating the competitive market economy and fiscal policy and (2) the normative theory about the role of government, evidenced by regulatory and fiscal policies. We have chosen to tie the elements of the social scientific theories of the reviewed texts into the "eras" of Canadian economic and social policy, not necessarily to show some causal effect between the two, but to stir discussion about the possibility of causality or correlation between economic policy eras and the ways in which academics have studied health policy.

Drawing principally on the work of Geoffrey Hale (2002) and others (O'Neill 1997; Rice and Prince 2000; Marchildon 2006; Lazar et al. 2004; Maioni 2002), we divided the periods marking the key development of medicare into five economic eras:

- 1945–1967: Post–Second World War Keynesianism and the expansion of the welfare state
- 1968–1983: Market regulation, expansion of the welfare state and deficit spending
- 1984–1992: Deregulation, privatization, commercialization and deficit spending
- 1993–2003: Fiscal restraint and decrease in health and social spending
- 2004–2006: Beginning of reinvestment in health and social spending

Of note, given the time lag between paper submission and publication date, we used a measure of discretion by including a paper within the era of inclusion that we deemed most relevant.

1945–1967: Post–Second World War Keynesianism and the expansion of the welfare state

In Canada and elsewhere, the post-war period saw the emergence of a broad social consensus in favour of a new economic and social model for the nation (Lightman 2003: 4). In policy terms, the consensus was concretized with the establishment of the Canadian welfare state, of which medicare was a cornerstone (Rice and Prince 2000: 232–40).

The papers published during this period mark the first forays by the political science profession into the topic of medicare. Those published in the era introduce an interest in institutions and interest groups as the primary unit of analysis that would become perennial in the output of the profession over the 60 years that followed. Between 1946 and 1960, three notable papers were published: Taylor (1960), writing in the pluralist vein, examined the role of the medical profession in health insurance decision-making, whereas Gelber (1966) explored the institutional dimension of establishing a health insurance system. However, Gray's (1946) paper, in the *Canadian Journal of Economics and Political Science*, was the first to signal the profession's interest in the politics of health insurance with a Canada–US study of the forces that influenced the development and shape of public health insurance plans. This approach would introduce into the profession not only a new topic of inquiry but also establish a frequently emulated focus on institutions and interest groups. In this sense, Taylor (1960) and Gelber (1966) are both heirs to Gray's original study. Looking forward, we see a lineage between these early papers on medicare and the later ones, such as Howlett (2002), Geva-May and Maslove (2000) and Tuohy (1988).

1968–1983: Market regulation, expansion of the welfare state and deficit spending

The years immediately following Canada's centennial were marked by the continued development and expansion of the Canadian welfare state. By 1972, all provinces had concluded agreements with Ottawa for the establishment of medicare (Rice and Prince 2000: 70). Yet, within five years of this landmark year, the Canadian welfare state would experience a contraction. Up to this point, political constraints on the growth of social spending were few, but the conjunction of a global economic slowdown and the steady growth of the federal government's budget deficit and apprehended fiscal policy crisis caused a political and economic challenge to the Canadian welfare state (Hale 2002: 150–51). Thus, if the start of this second economic era was marked by the expansion of social entitlements, it ended with the first frontal attacks on the edifice of the post-war Keynesian consensus and the dampening of the commitment to the fiscal underpinning of the welfare state and medicare (Marchildon 2006: 7).

The shifting political and economic tides are not reflected in the output of the profession during this period. The focus of the studies continued to be on the founding actors and decision-making models that had marked the establishment of medicare and the Canadian welfare state. Thus, Taylor (1972) reprises his earlier interest in the role played by the medical profession and the clash of this entrenched interest with the policy makers of the day. This was also the theme of Tuohy's (1976) paper. Only Rivest's (1984) paper is notable because of its focus on the state and his interest in the factors that contributed to the development of the welfare state in Canada. Published at a time when Canada was in the midst of an economic downturn, Rivest's paper introduces themes that reflected the changing political and societal attitude towards the welfare state. His concern with the *raison d'être* of the state's role in medicare served as a challenge to those who promoted disengagement. In this way, Rivest marks both the end of the second economic era while introducing themes that would be germane in the economic era to follow.

1984–1992: Deregulation, privatization, commercialization and deficit spending

Nineteen eighty-four marked the start of a new economic and social policy era, as well as a new political era, with the election in September of the Progressive Conservative Party. Led by Brian Mulroney, Canada joined the United Kingdom and the United States in having conservative governments, although Mulroney's paled in comparison to the latter in its adherence to neo-liberalism. For example, while the Conservatives were the Official Opposition, they supported the passage of the *Canada Health Act* – a landmark piece of legislation that consolidated medicare as a touchstone social policy. Looking back on the two Mulroney governments, it is evident that economic policy outweighed social policy as a priority (Hale 2002: 181). Overall, medicare emerged virtually intact after the Mulroney government (O'Neill 1996).

The papers published in this third economic era break down almost equally between the institutionalist and pluralist approaches. Barker (1989), Mhatre and Deber (1992) and, to a lesser extent, Lemieux (1989) typify the institutional approach, with studies focusing on public inquiries and decision-making within the governmental machinery. Fulton and Stanbury (1985) and Tuohy (1988) reprise a familiar theme in the literature by focusing on the arbitrage and influence role played by the medical profession in medicare decision-making. It could be said that the contributions of this era attempt to explain governmental decision-making using different lenses.

However, this era is notable in that the public tumult over the future of medicare percolated into the academy and, we propose, may explain the notable increase in the number of papers by Canadian political scientists written in the following decade.

1993–2003: Fiscal restraint and decrease in health and social spending

The return of the Liberal Party to federal office marked the second major retrenchment in the funding of medicare. Faced with unprecedented fiscal and exogenous pressures from the international financial community, the new Chrétien government borrowed from the neoliberal economic policy playbook to bring the federal budget deficit under control through reductions in federal program spending (Hale 2002: 225). For medicare, the fiscal "horse medicine" imposed by finance minister Paul Martin resulted in the amputation of the federal government's share of medicare funding and a rate of increase set below GDP growth (Lazar et al. 2004: 193). Coupled with the efforts of provincial finance ministers to address their own budgetary deficits (now made worse by federal actions), the future viability of medicare was increasingly at issue.

This fourth economic era is the one that saw the most activity in terms of the profession's output, possibly a delayed echo of the events of the previous economic era. The themes that emerge in the literature during this era concern the politics of retrenchment and the consequences of fiscal restraint in social policy. For example, Philipon and Wasylyshyn (1996) see a new fiscal paradigm as the principal motivation behind health reforms in Alberta, while Maioni (1998) uses this dimension to explore the diverging policy paths of the United States and Canada. In a study that considered the broader social policy field, Bashevkin (2000) returns to the theme of divergence between the Canadian and American policies. Given the interest of American political scientists for Canada's medicare, it is notable that Maioni and Bashevkin were the first to consider the Canada–US comparative set since Gray's 1946 paper.

This era also saw the publication of papers focused on particular dimensions of the healthcare debate – moving away from a strict focus on the politics of medicare to a broader consideration of health politics. Typical of this approach are Orsini's (2002) paper on the emergence of cause activism in Canada and Prince's (2001) discussion of federalism and the politics of disability. Both papers highlight a return to the traditional focus on both institutionalism and pluralism.

2004–2006: Beginning of reinvestment in health and social spending

The final economic era studied is possibly too short to make any definitive inferences on the profession's output. In these three years, several changes in government at the federal and provincial levels (including three back-to-back minority governments at the federal level) have occurred, and the long-term consequences of the 2008–2009 global financial crisis are still unknown. The initial trend line, as drawn by the last years of the Liberal Party in federal office, point towards a reinvestment in medicare and the social welfare state generally (Lazar et al. 2004: 207). At time of writing, the Conservative Party – in office federally since 2006 – has not steered away from this course.

Although we eschew any broad generalizations given the limited literature published during this period, we do note a concern by members of the discipline with the politics of healthcare financing and medicare reform (St-Hilaire and Lazar 2003; Abelson et al. 2004; Davidson 2004; Church and Smith 2006). St-Hilaire and Lazar (2003) are principally concerned with intergovernmental discussions on medicare funding, while Davidson (2004) and Abelson and colleagues (2004) are concerned with policy trends, the former focusing on governments as the unit of analysis and Canadian public attitudes. All three papers are firmly anchored in the institutional approach. Church and Smith (2006), for their part, resort to a more traditional pluralist approach to explain developments in Alberta. At a very early stage in an economic era that has yet to be truly defined, we see a literature still articulating the issues in terms of developments branded in a period of restraint.

Discussion

As Table 1 shows, the majority of Canadian scholarly interest on the topic of medicare coincides with the two periods marked by retrenchment (1984–1992 and 1993–2003). During these periods, two analytical trends emerge: the relative balance between the use of deductive and inductive methodologies, and the use of institutions as the principal units of analysis. The balance between papers written deductively and inductively is an indication of Canadian political scientists' ability to utilize both induction to come up with ideas or theories, and deduction to validate ideas. Ultimately, neither method is intrinsically preferable to the other.

TABLE 1. Six decades of inquiry into Canadian medicare

	Post-WWII Keynesianism and expansion of the welfare state 1945–1967	**Market regulation, expansion of the welfare state and deficit spending 1968–1983**	**Deregulation, privatization, commercialization and deficit spending 1984–1992**	**Fiscal restraint and decrease in health and social spending 1993–2003**	**Beginning of reinvestment in health and social spending 2004–2006**
Unit of Analysis: Structures; Method of Analysis: Inductive	Taylor (1960)		Barker (1989), Lemieux (1989)		
Unit of Analysis: Structures; Method of Analysis: Deductive		Taylor (1972)	Swartz (1993)	Howlett (2002)	
Unit of Analysis: Institutions; Method of Analysis: Inductive	Gray (1946), Gelber (1966)		Barker (1989), Mhatre & Deber (1992)	Philipon & Wasylyshyn (1996), Maioni (1998), Wilson (2001), Kelly (2001), St-Hilaire & Lazar (2003)	
Unit of Analysis: Institutions; Method of Analysis: Deductive		Taylor (1972), Tuohy (1976), Rivest (1984)		Bashevkin (2000), Geva-May & Maslove (2000), Prince (2001)	Davidson (2004), Church & Smith (2006)
Unit of Analysis: Groups; Method of Analysis: Inductive	Taylor (1960)				

TABLE 1. Continued

Unit of Analysis: Groups; Method of Analysis: Deductive		Taylor (1972), Tuohy (1976)	Fulton & Stanbury (1985), Tuohy (1988)	Prince (2001), Orsini (2002)	
Unit of Analysis: Individuals; Method of Analysis: Inductive				Redden (2002)	Abelson et al. (2004)
Unit of Analysis: Individuals; Method of Analysis: Deductive				Bashevkin (2000)	

If the methodological approach tended towards a relative balance between induction and deduction, we find a very strong disposition in the Canadian profession for writing on medicare from an institutionalist perspective. As Table 1 shows, the vast majority of papers rely on this framework. Papers written from an institutionalist perspective were more prevalent during periods when political and bureaucratic institutions seemed to hold greater sway over charting the future of medicare. By contrast, pluralist writings, those concerned principally with the influence of interest groups, were less prevalent between 1984 and 2003, a period that was marked by the increased influence of international financial institutions over social policy directions. If the academy reflects the political, economic and social context of the period, then it follows that a period marked by numerous public inquiries and commissions would also demonstrate an institutionalist bent (see Ham 2001). Also typical of the dominance of institutionalism is the concern with medicare's history and contemporary challenges, as opposed to the correlation between medicare and affected groups and individuals.

Given the fact that political scientists during the 1993 to 2003 period focused primarily on institutions rather than interest groups, we might conclude that the health policy making (formulation) process is of greater interest to scholars because institutions are the prime makers of health policy. The choice to study formulation can be attributed to the fact that this activity determines the substance of health policy. Thus, the consideration of procedure and substance may be complementary; policy formulation, which is characteristically "procedural," determines the substance – the final, singular aims and essential attributes of health policy.

In this manner, we subscribed to Sinclair's (1981) assertion that we can differentiate principle from action. In the papers we reviewed, we can see this in the focus on either the principles inherent in medicare policy making or in the actions taken by political actors. Policy change is more a political than an epistemological process, and policy debates focus on tools rather than aims (Davidson 2004: 253). This is true also in the case of medicare.

Observations

The preceding literature review sought to determine, through processes of internal (methodology and framework) and external (temporal) classification, the contribution made by Canada's political scientists to the study of medicare. From the outset, we were conscious of the project's limitations. Some were discussed previously in terms of the study selection methodology. Are there other ways of measuring the contribution of academicians to public policy debate? The answer must be affirmative. For example, 11 of the 40 research reports commissioned by Canada's Commission on the Future of Health Care (the Romanow Commission) were authored by political scientists (see Forest et al. 2004). This would point to a high degree of contribution by Canadian political scientists to this area of public policy.

Is it possible to arrive at a concise and generalizable perspective on the contribution of Canadian political science to the study of medicare? Can we agree with Richard Simeon's proposition that "what is true of Canada generally is, of course, more so for those who study its politics" (2002: x) by looking at Canadian political scientists' scholarly contributions to the topic? We answer in the affirmative to both questions and put forth the following proposition: The Canadian profession's principal contribution to the study and debate about medicare was to clarify the institutional dimensions that frame decision-making. Institutionalism, particularly the focus on the interactions between government and administrative institutions and dominant or influential social interests, has been a pre-eminent approach in the Canadian political science outlook on medicare. It is also exercised indirectly, where clarity around institutions enhances debate on medicare among the profession, but also in other fields of study, for example, health economics or law.

Our review was unable to determine whether the discipline's scholarly attention contributed to the public debate on medicare. Any observations in this regard would have required the inclusion of a far broader sample of publications – journalistic and similar. However, we can agree with Simeon's (2002: x) previously cited proposal: Canadian political scientists are indeed members of society whose work mirrors the preoccupations of the broader public. Over six decades, the discipline's scholarly output mirrored the economic or social circumstances of the time. For example, the high incidence of papers written between 1993 and 2003 coincides with the period when the federal government was cutting investments in social and health policy, most notably through the creation of the Canada Health and Social Transfer. If this attribution of cause is correct, then, assuming that scholarly research objectives are moved by values, beliefs and concerns and are not arbitrarily chosen, it might be the case that academic interest in medicare is motivated by the same factors of public attachment to medicare that Boychuk (2008) and others have identified.

While we found a consistent interest in the topic of medicare among Canadian political scientists, we noted that the vast majority of the papers were published in English. Although we made specific efforts to ensure that French-language contributions were included in the study, few were found. This is not to state that the Québécois profession is uninterested in the topic. Among the papers considered in this study, Forest and colleagues (2004), Abelson and colleagues (2004), Maioni (1998), Lemieux (1989) and Rivest (1984) made contributions to scholarship on medicare at critical points in and around the public debate on its evolution. However, the number of scholarly papers found was comparatively small. This finding can be explained in part by our decision to focus on Canadian or health policy journals; the Quebec-based profession may be publishing in non-Canadian journals or journals not explicitly devoted to the study of health politics and policy, as is the case with Maioni's (1998) paper.

Finally, when looking at the output of the profession over 60 years, we note the primacy of normative inquiry over theoretical modelling. Although we cannot generalize from this limited study on the preferences of the entire discipline, perhaps medicare provides fertile ground for deductive inquiry.

Conclusion

If the political science profession showed itself an able communicator on the institutional constructs that affect decision-making, and if scholarly output was indeed in response to broad economic and social conditions at play, we found few examples where the literature was used as a pulpit for commentary or proposals for reform. This is not to say that there are no such cases. Swartz (1993) and Boase (2003), for example, ably mix commentary with analysis. And while all things must balance, we note that this lack of normative pronouncements may limit the impact of Canadian political scientists' overall contribution to the debate on medicare – though perhaps this is an issue for another forum.

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RESEARCH PAPER

Hospital Expenditure as a Major Driver of Nurse Labour Force Participation: Evidence from a 10-Year Period in Canada

Les dépenses hospitalières comme force motrice de la participation de la main-d'œuvre infirmière : dix ans de données au Canada

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Abstract

This paper examines trends in the nursing labour market in Canada over a period of dramatic fluctuations in hospital expenditures. We add to previous analysis that covered the period 1991–1996 and use Census data from 2001 to examine the relationship between hospital expenditure and nurse labour force participation. We find that shifts in labour force participation over the period 1991–2001 had a significant impact on the nursing supply in Canada. Individuals who were trained in nursing but were working outside the profession in 1996 because of budgetary reductions and layoffs in hospitals had largely been reabsorbed back into nursing jobs by 2001. Our analysis provides further empirical evidence that the labour force participation among individuals trained in nursing is driven to a large extent by demand-side factors.

Résumé

Cet article examine les tendances du marché de la main-d'œuvre infirmière au Canada au cours d'une période qui a connu d'importantes fluctuations en termes de dépenses hospitalières. Notre travail s'ajoute à une analyse antérieure portant sur la période 1991-1996 et nous utilisons les données du recensement de 2001 afin d'examiner la relation entre les dépenses hospitalières et la participation de la main-d'œuvre infirmière. Nous constatons que les changements observés dans la participation de la main-d'œuvre au cours de la période 1991-2001 ont eu un effet significatif sur l'offre de la main-d'œuvre infirmière au Canada. Les personnes qui ont reçu une formation en soins infirmiers mais qui, en 1996, travaillaient hors de ce secteur, en raison des coupures budgétaires et des mises à pied dans les hôpitaux, ont été largement réintégrées dans le secteur infirmier dès 2001. Notre analyse offre d'autres données empiriques indiquant que l'activité de la main-d'œuvre des personnes formées en soins infirmiers dépend grandement des facteurs liés à la demande.

* * *

Many argue that Canada has for several years been experiencing a nursing shortage, and the situation is likely to worsen in the future (AHA 2001; Oulton 2006; CNA 2009). One often overlooked policy option for increasing the supply of nurses is to try to recruit individuals trained in nursing who are either not working, or who are working in non-nursing jobs, back into the nursing profession. However, both in Canada and elsewhere, there is very little information on the size of this potential additional supply of nurses, the reasons these individuals choose to not work or to work in non-nursing jobs, and the impact that recruiting them back into nursing jobs would have on the supply of nurses in Canada.

This paper examines trends in the nursing labour market in Canada over a period of dramatic fluctuations in hospital expenditures. Beginning in 1992, governments throughout Canada began reducing expenditures in an effort to eliminate fiscal deficits and reduce their alarmingly high debt burden. As part of this deficit-fighting campaign, hospital expenditure levels decreased quite dramatically. Vujicic and Evans (2005) showed that nursing supply (defined as the total number of registered nurses and licensed practical nurses employed in the healthcare system) decreased during this period of hospital expenditure cut-backs, especially among the youngest age groups. Their analysis further showed that a large proportion of the young RNs and LPNs who lost their nursing jobs took up work in non-nursing occupations at 25%–30% lower pay levels. Thus, the hospital cut-backs of the 1990s generated a large pool of individuals who were trained to work in nursing (either as RNs or LPNs) but were working in non-nursing jobs. By 1996 there were an estimated 15,000 such individuals in Canada – a potentially significant source of nursing labour supply. Other studies covering this period in Canada also demonstrated large movement of various cadres of nursing professionals out of hospitals into other work settings or out of the labour market completely (Alameddine et al. 2005, 2009).

Since this initial analysis, the fiscal landscape has shifted dramatically. Hospital expenditure levels in Canada have increased steadily since 1996 (Figure 1). By 2001, real hospital expenditure had recovered to pre–cut-backs levels, and the increase was quite dramatic in some provinces.

Increases in health expenditure, and hospital expenditure in particular, have been shown historically to lead to an increase in the demand for health workers (Barer et al. 1984; Dussault and Vujicic 2008; Vujicic and Zurn 2006; WHO 2006). The shift in health spending patterns since 1996 in Canada, therefore, provokes several interesting policy research questions: What happened, after 1996, to the labour force participation of individuals trained in nursing in Canada? Did the share of qualified nursing staff working in non-nursing occupations drop? How big was the pool of individuals trained in nursing who were working in non-nursing occupations after hospital expenditure recovered? If these individuals had been drawn back into nursing jobs, what would have been the impact on nursing supply? This paper explores all these questions.

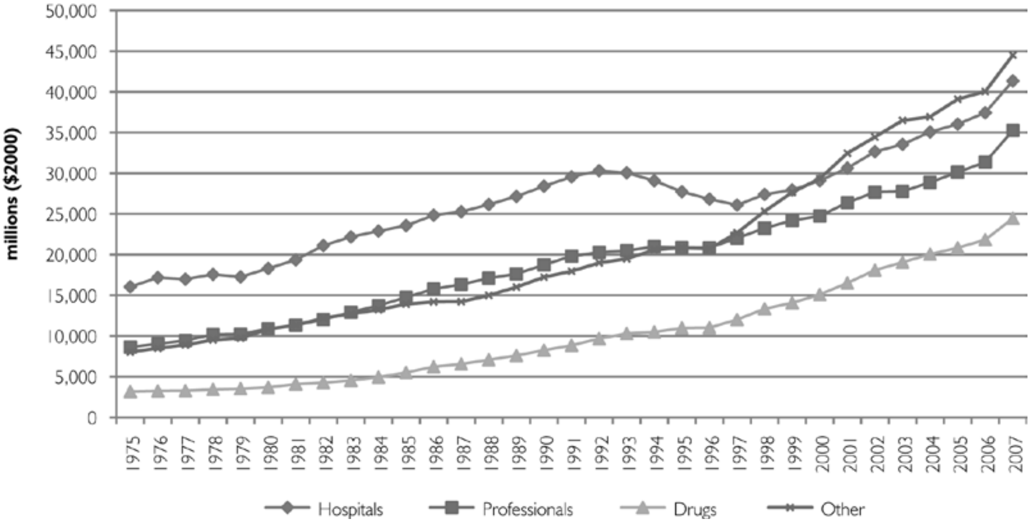
Methodology and Data

This paper analyzes data from the Registered Nurses' Database (RNDB) at the Canadian Institute for Health Information (CIHI) and from the Census of Canada. To work as a nurse, one must be registered by the relevant provincial or territorial regulatory college. The RNDB is a pan-Canadian database that collects demographic, education and employment information on all registered nurses in Canada, as collected under the terms of agreements with the provincial or territorial regulating authorities.

The Census of Canada allows us to identify individuals whose major field of study is nursing and who have completed at least a diploma program. Unlike other labour force surveys, this unique approach allows us to create a sample of individuals who have the educational qualification to work in nursing – what can be called the potential supply of nursing staff. Note that this nursing pool includes both RNs and LPNs, as these groups are not distinguished in the Census files. We restrict our analysis only to those with at least a diploma-level education in nursing. Thus, nursing occupations such as aides and orderlies are excluded.

We analyze key labour market outcomes of these individuals and compare them to other occupations and over time. We use the Public Use Microdata File (PUMF) located at the University of Toronto for our analysis. This file contains aggregated education and employment data from the 1-in-30 sample that Statistics Canada aggregates from the long form in Census years.

FIGURE 1. Real health expenditure in Canada by use of funds



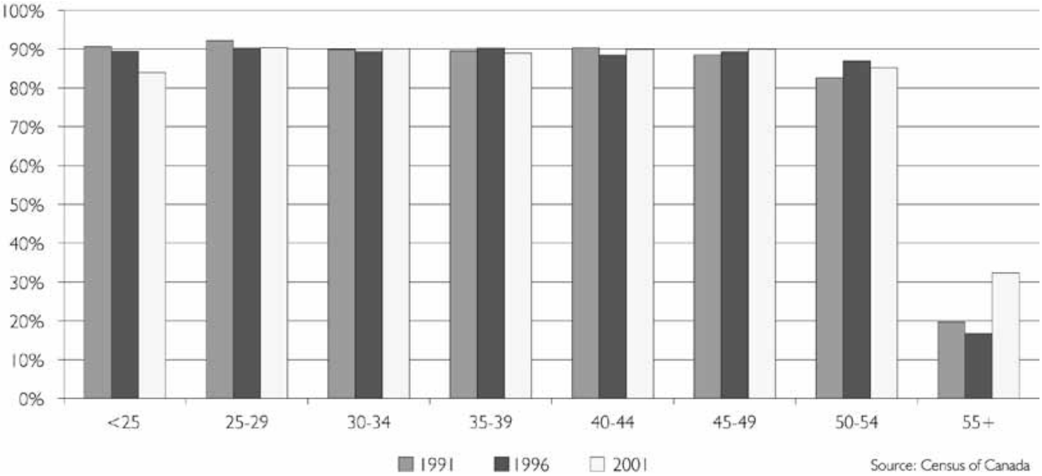
We compare results from our 2001 Census analysis to similar data from 1991 and 1996 presented in previous work (Vujicic and Evans 2005). Thus, this paper gives a picture of the nursing labour market before, during and after a period of major hospital expenditure reductions in Canada. Unfortunately, in the 2006 Census the major field of study variable was modified, and it is not possible to carry out the same analysis for 2006.

Results

Labour force participation rate of nurses

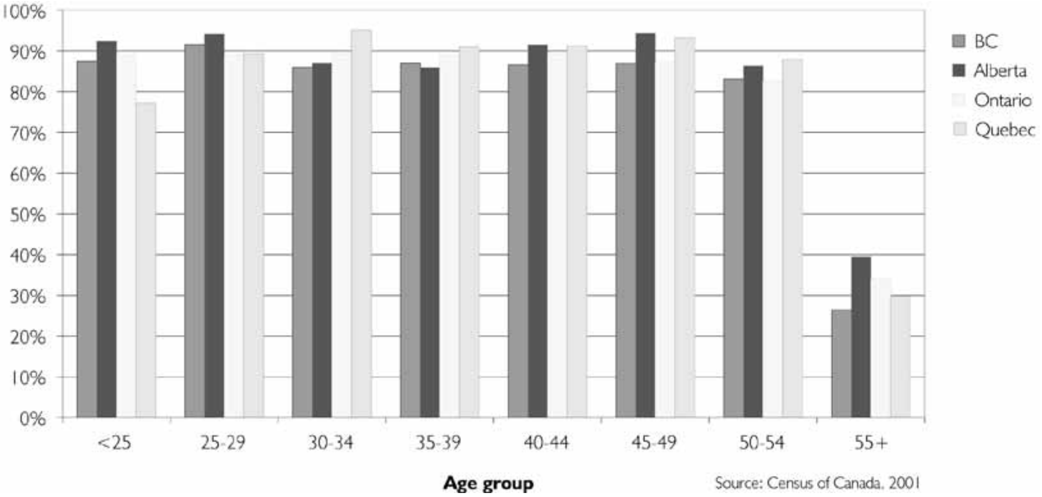
Figure 2 presents the labour force participation rate (LFPR) of all individuals who are trained in nursing by age group in Canada. The LFPR is the share of the population in each age group that is either employed, or unemployed and seeking employment. Overall, the LFPR has remained fairly stable. The only major changes are a decrease from 91% to 83% among those under 25 and a 10% increase for those 55 and older. The national data, however, mask significant variation across provinces. For example, in 2001 the LFPR for the under-25 age group was 77% in Quebec compared to 92% in Alberta (Figure 3). For older age groups, however, Quebec tends to have the highest value. Because 95% of individuals trained in nursing are female, we compare the labour force participation rate of these individuals with the female population in general. We found that those with nurse training have a slightly higher LFPR than the female population in general in Canada. We also found that provincial variation in the LFPR of those trained in nursing is explained to a very large extent by differences among females in general (results not shown).

FIGURE 2. Labour force participation rate of individuals trained in nursing



Source: Census of Canada

FIGURE 3. Labour force participation rate of individuals trained in nursing, select provinces



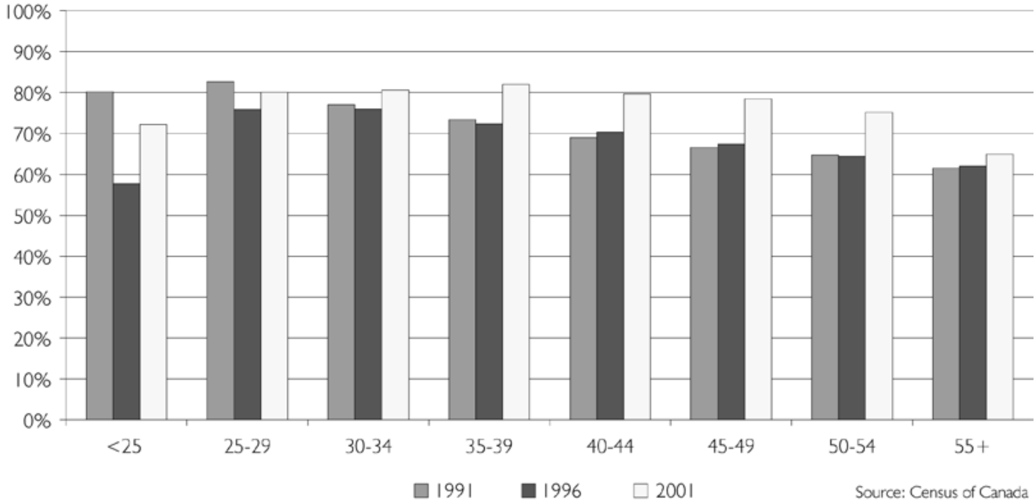
Source: Census of Canada, 2001

Healthcare labour force participation rate of nurses

The healthcare labour force participation rate (HCLFPR) is the share of employed individuals trained in nursing who are actually working in nursing occupations. We use the same methodology as the previous analysis (Vujicic and Evans 2005). As noted earlier, there was a sharp decrease in the HCLFPR between 1991 and 1996 for the youngest age groups. During this period, hospital expenditure fell dramatically in Canada; hospitals reduced hiring and laid off staff. Owing to the structure of the nursing labour market, the youngest nursing staff were most affected. Given the trends in health spending since 1996, the key policy questions are: (1) did the HCLFPR in 2001 return to 1991 levels (i.e., pre–expenditure cut-backs)? (2) were those who were working outside nursing in 1996 still working outside the profession in 2001? and (3) how did fluctuations in the HCLPR affect nursing supply?

Figure 4 shows the HCLFPR for different age groups over time. There are three main patterns of interest. First, the HCLFPR increased between 1996 and 2001 for all age groups. Second, for the youngest age groups the HCLFPR in 2001 remained below its pre-downsizing level. For example, the HCLFPR for those under 25 increased from 58% in 1996 to 72% in 2001 but was well below the 1991 level of 80%. For the 25–29 age group the same pattern holds – an increase since 1996, but not to 1991 levels. Third, for those 30 and over the HCLFP increased between 1996 and 2001 to levels that are 3–12 percentage points above the pre–cut-backs levels.

FIGURE 4. Healthcare labour force participation rate of nurses



Source: Census of Canada

To get a sense of how changes in the HCLFPR affected nursing supply during this period, we performed some very simple simulations, which are summarized in Table 1. The first simulation shows the impact on nursing supply in Canada in 2001 if, all else being equal, the HCLFPR in 2001 was set at its 1996 level for all age groups. Results show that under this scenario, nursing supply in 2001 would have been 8.2% lower.

The second simulation shows what would happen to nursing supply in 2001 if, all else being equal, the HCLFPR in 2001 was set at its 1991 level for each age group. Under this scenario, nursing supply in 2001 would have been 6.8% lower. This decrease is driven by the fact that the 1991 HCLFPR is smaller than the 2001 rate for those over 30. For the under-30 age group, the failure of the HCLFPR to recover to 1991 levels had a relatively small impact on nursing supply in 2001 – only a 0.8% reduction.

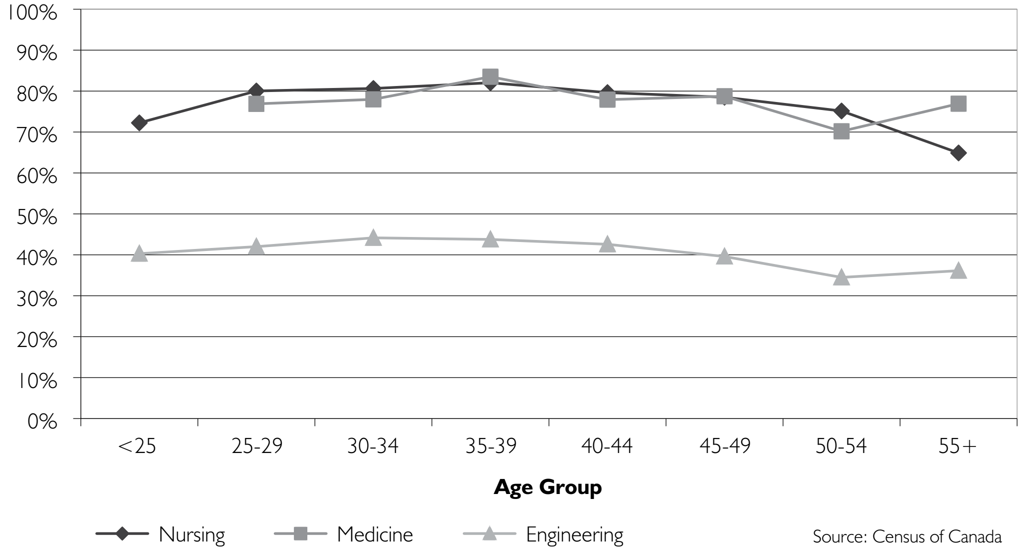
TABLE 1. Impact of change in HCLFPR on the 2001 supply of nurses

Effect on supply of nurses if HCLFPR in 2001 is set at 1991 level			Effect on supply of nurses if HCLFPR in 2001 is set at 1996 level		
Age		Cum. Tot.	Age		Cum. Tot.
<25	0.3%	0.3%	<25	–0.6%	–0.6%
25–29	0.2%	0.5%	25–29	–0.4%	–0.9%
30–34	–0.4%	0.1%	30–34	–0.5%	–1.5%
35–39	–1.2%	–1.0%	35–39	–1.3%	–2.8%
40–44	–1.7%	–2.7%	40–44	–1.4%	–4.2%
45–49	–2.1%	–4.8%	45–49	–2.0%	–6.2%
50–54	–1.5%	–6.3%	50–54	–1.6%	–7.8%
55+	–0.5%	**–6.8%**	55+	–0.4%	**–8.2%**

We also simulated the effect on nursing supply in 2001 if the HCLFPR were to increase even higher. To get a sense of what value might be an upper bound, we examined industry-specific labour force participation rates for two groups: female doctors and female engineers. Their industry-specific labour force participation rates provide a rough benchmark. We followed the methodology of Boyd and Schellenberg (2007) for constructing the sample of individuals trained as physicians and engineers working in the medical and engineering professions, respectively. Figure 5 summarizes these data. It shows the share of employed females trained as physicians who were working in healthcare occupations, and the share of employed females trained as engineers who were working in engineering occupations. The rates for medicine and nursing are very similar (except for the 55-and-older age group), both of which are much higher than for engineering. If the HCLFPR for those trained in nursing is set at the rate for female doctors, nursing supply in 2001 would have been 0.6% higher. If the HCLFPR in nursing is set at 80% for all age groups, nursing supply in 2001 would have been 3.2% higher. Taken together, these simulations demonstrate clearly that changes in the HCLFPR matter because they have a significant impact on nursing supply in Canada.

Another important policy question we explored is whether those particular individuals trained in nursing but working in non-nursing jobs in 1996 were still in non-nursing jobs in 2001. Vujicic and Evans (2005) argued that the low HCLFPR among the youngest age groups in 1996 was due to hospital layoffs and was, therefore, involuntary. It was not the case that these individuals took up higher-paying non-nursing jobs. If that indeed had been the case, as health spending increased and more nursing vacancies opened, one would expect to see movement back into nursing jobs among this group. On the other hand, these individuals may have accumulated non-nursing human capital during the hospital downsizing period and may not have found it attractive to re-enter the nursing profession. Some of them could have been out of the nursing profession for up to 10 years.

FIGURE 5. Share of employed individuals trained in nursing, medicine and engineering working as nurses, physicians and engineers, respectively, 2001



Source: Census of Canada

Although it is not possible to follow a panel of individuals using the Census data, it is possible to compare the HCLFPR for the under-25 age group in 1996 to the 25–29 age group in 2001. For those who were under 25 in 1996, there indeed was a movement back into nursing occupations by 2001, almost fully to 1991 levels. For those who were 25–29 in 1996, the HCLFPR in 2001 actually exceeded its 1991 value. These data suggest that the hospital expenditure reduction policies of the early 1990s did not lead to a permanent reduction in the HCLFPR among young individuals trained in nursing. Rather, those who were forced out of nursing jobs because of hospital layoffs in 1996 appear to have been reabsorbed into the nursing profession by 2001 as hospital expenditure increased.

Discussion

There are four main conclusions that emerge from our analysis. First, changes in the HCLFPR matter. Our results show that had the HCLFPR in 2001 remained at its 1996 level, total nursing supply in 2001 would have been 8.2% lower – a significant amount in an environment of labour shortages.

Second, the changes in the HCLFPR were not uniform across different age groups during the 1991–2001 period. The HCLFPR of those under 30 recovered by 2001, but not to levels predating hospital cut-backs. For those over 30, however, the HCLFPR in 2001 was much higher than it was prior to the hospital cut-backs. Interestingly, the failure of the HCLFPR to recover to 1991 levels for those under 30 did not have a significant impact on nursing supply – it caused only a 0.6% reduction in nursing supply in 2001. The increase in the HCLFPR since 1996 for those 30 and over more than compensated for this reduction. For the 30-and-over group, the increase in the HCLFPR between 1991 and 2001 led to a 7.4% increase in nursing supply in Canada.

Third, the pattern of the HCLFPR between 1991, 1996 and 2001 is quite similar in Quebec, Ontario, Alberta and British Columbia, the four provinces we examined. There are some differences in the magnitudes of change, but overall the age-specific HCLFPR moved in the same direction in all four provinces over the period of study.

Fourth, comparisons to other professions suggest that the HCLFPR in 2001 might have been approaching an upper threshold. Only among the oldest (55 and over) age group did there seem to be scope for further increases. But this group made up only 14% of nursing supply in 2001 (according to our sample), and marginal increases in the HCLFPR were unlikely to have a significant impact on nursing supply.

Taken together, our analysis shows that there was a significant shift in the nursing labour market between 1996 and 2001. The large pool of individuals trained in nursing but working in non-nursing jobs in 1996 had largely re-entered nursing occupations by 2001. This analysis provides further evidence to suggest that the HCLFPR is driven primarily by nursing labour demand which is, in turn, driven largely by hospital expenditure.

Should policy makers focus on recruiting trained nurses working outside nursing back into nursing jobs as a means of easing today's nursing shortage? It is not possible to gather more current data on the HCLFPR, as noted earlier. But according to the 2001 data, such a policy is likely to have minimal impact. The HCLFPR of the youngest age group in 2001 was already back to pre–cut-backs levels, and even if it were to increase further, this would have a negligible impact on nursing supply, as our simulations show. For older age groups, the HCLFPR in 2001 was much higher than pre–cut-backs levels, as well as compared to other occupations. This finding suggests little scope for further increases. As a result, our analysis would suggest that policy makers might focus on alternative strategies, such as scaling up nurse training, task shifting, relying more on migrant nurses or increasing labour productivity.

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RESEARCH PAPER

Assessing the Acceptability of Quality Indicators and Linkages to Payment in Primary Care in Nova Scotia

Évaluation de l'acceptabilité des indicateurs de qualité et de la mise en lien des paiements pour les soins de santé primaires en Nouvelle-Écosse

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Abstract

In 2006, the Canadian Institute for Health Information (CIHI) released a comprehensive set of quality indicators (QIs) for primary healthcare (PHC). We explored the acceptability of a subset of these as measures of the technical quality of care and the potential link to payment incentive tools. A modified Delphi approach, based on the RAND consensus panel method, was used with an expert panel composed of PHC providers (family physicians, nurses and nurse practitioners) and decision-makers with no previous experience of "pay for performance." A nine-point Likert scale was used to rate the acceptability of 35 selected CIHI QIs in community practice and the acceptability of a payment mechanism associated with each. QIs rated with disagreement were discussed and re-rated in a face-to-face meeting. The panel rated 19

QIs as "acceptable." Payment incentives associated with these QIs were acceptable for 13. Several factors emerged that were common to the less appealing QIs with respect to payment linkage.

Résumé

En 2006, l'Institut canadien d'information sur la santé (ICIS) publiait un ensemble complet d'indicateurs de qualité (IQ) en matière de soins de santé primaires (SSP). Nous avons étudié l'acceptabilité d'un sous-ensemble de ces indicateurs comme mesures de la qualité technique des soins ainsi que le lien potentiel avec les outils d'incitation au paiement. Nous avons employé une méthode Delphi modifiée, fondée sur la méthode de consensus RAND, auprès d'un panel de spécialistes composés de professionnels des SSP (médecins de famille, infirmières et infirmières praticiennes) et de décideurs qui n'avaient pas d'expérience préalable en matière de « rémunération au rendement. » Une échelle de Likert en neuf points a été utilisée pour classer, d'une part, l'acceptabilité de 35 IQ de l'ICIS dans le milieu de la pratique et, d'autre part, l'acceptabilité d'un mécanisme de paiement associé à chacun d'eux. Les IQ classés « en désaccord » ont été discutés et reclassés lors d'une réunion en face-à-face. Le panel a classé 19 IQ dans la catégorie « acceptable. » Les incitatifs au paiement associés à ces IQ ont été jugés acceptables pour 13 d'entre eux. Plusieurs facteurs communs ont émergé pour les IQ moins attrayants au regard de la mise en lien avec les paiements.

* * *

HEALTH INDICATORS ARE "STANDARDIZED MEASURES THAT CAN BE USED TO MEASure health status and health system performance and characteristics across different populations, between jurisdictions or over time" (CIHI 2005). An indicator is an evidence- or consensus-based standardized measure that conveys a dimension of health system structure, healthcare process (interpersonal or clinical) or health outcome (Marshall et al. 2003). Indicators can be used to assess performance; monitor health status; provide information for program or policy planning, evaluation and resource allocation; explore equity; track changes over time; identify gaps in health and healthcare (CIHI 2006c); and achieve accountability (CIHI 2005; Committee on Redesigning Health Insurance Performance Measures 2006). They are used as tools for measuring the quality of care in "strategic planning and priority setting, supporting quality improvement and for conveying important health information to the public" (CIHI 2005). Quality-of-care indicators (also called quality indicators [QIs], performance indicators or performance measures) for primary healthcare (PHC) have been developed and subjected to preliminary testing over the past decade in a number of countries worldwide (Engels et al. 2005; Marshall et al. 2003; McGlynn et al. 2003). Large-scale efforts to develop and use QIs as a tool to enhance the quality of care through "pay for performance" have been in use in the United States and, most extensively, in the Quality Outcomes Framework in the United Kingdom (Lester et al. 2006; Roland 2004, 2007).

Unlike other countries, Canada's early stages of PHC quality indicator development and application are only just underway. In Ontario, a panel of primary healthcare practitioners has evaluated and selected performance indicators (Barnsley et al. 2005). Nationally, the Canadian Institute for Health Information (CIHI) released in 2006 a comprehensive set of indicators encompassing all aspects of PHC practice in response to the objectives of the PHC Transition Fund National Evaluation Strategy (CIHI 2006c). As QI development unfolds, broader assessment of the acceptability of specific indicators as measures of quality in practice and the simultaneous assessment of acceptability to practitioners of including the indicators in possible payment strategies need to be explored. Even though comprehensive data sources do not presently exist to calculate many of the CIHI indicators (CIHI 2006c), feasibility work is underway to guide modifications to existing electronic medical records for data capture strategies and sources (CIHI 2006b). We recognize that the identification of quality indicators considered acceptable to providers and decision-makers is only one component of a broad strategy of performance measurement and management.

This paper reports on the first phase of a three-phased, mixed-methods study to assess the acceptability and feasibility of a quality-of-care orientation to primary healthcare. The purpose of phase one was to explore the acceptability of a subset of the CIHI PHC quality indicators that are focused on measuring the quality of clinical care among a combined group of PHC professionals and healthcare policy decision-makers. Acceptability was explored from two dimensions: (1) which of the QIs were most acceptable to the participants as valid measures of quality, and (2) which of the QIs might be considered most acceptable to link to payment incentive tools.

Method

The Pan-Canadian Primary Health Care Indicators were developed and selected in a multi-stage process and formed the basis for this study (CIHI 2006c). We chose indicators for this study from the "quality in PHC" domain, one of eight domains in the full set of indicators. Our research team focused on this set of indicators because we believed it to be the one most relevant to practising clinicians in terms of the focus of their clinical work, unlike others targeted at the organization of care. These indicators are indeed most likely to be found, ultimately, in EMR systems as they mature. We believe these indicators, as also reported by CIHI (2006a), represent the greatest PHC data gap Canadawide and, with the use of newly emerging electronic medical records (EMRs), should become critical tools for QI assessment. Given our plan to test the feasibility of EMRs further to provide data elements for indicator assessment, we wished to reduce the existing 35 QIs in this domain to a ranked set considered acceptable by a multi-professional stakeholder group.

A two-staged modified Delphi/RAND Appropriateness method was employed to assess the acceptability of the subset of 35 CIHI PHC quality indicators. Thirty-five of 38 indicators identified in the Pan-Canadian Primary Health Care Indicator Development Project as indicators of quality in PHC and listed under CIHI Objective 5 – "To deliver high quality and safe primary healthcare service and to promote a culture of quality improvement in primary health care organizations" (CIHI 2006a) – were included. These 35 were not reliant on patient surveys and considered events of enough frequency that practice-level data would be meaningful. Fourteen of these QIs focused on risk assessment/screening/primary prevention/case finding, 16 targeted care for those with established conditions and five tapped the structure and functioning of the PHC organization.

Participants and process

Participants in our expert panel were selected through a search and nomination process, typical of modified Delphi and RAND techniques (Campbell et al. 2002; Campbell and Hacker 2002; Marshall et al. 2003). Nominations of participants were requested from the Nova Scotia College of Family Physicians, Nova Scotia Department of Health, Doctors Nova Scotia, Primary Health Care Information Management Program, primary healthcare nurses and nurse practitioners, community family physicians and research team members. Participants were sought to represent a range of age, gender, geographic settings, and traditional and new collaborative PHC practices.

Nominees who agreed to take part were sent, by courier and e-mail, a survey tool organized by QI, with a proposed measurement definition and several reference materials pertaining to measuring performance and the pros and cons of QIs in PHC. As part of the survey, panelists were asked to rate the acceptability of each indicator as a measure of quality of care within the influence of the scope of PHC and to assess the acceptability of payment potentially linked to each. Panelists were also encouraged to provide written comments about their ratings in terms of relevance to PHC, validity of the indicators and thoughts on issues related to possible payment linkages to indicator achievement.

A nine-point Likert scale, adapted from Marshall and colleagues (2003) and Normand and colleagues (1998), was used to rate the acceptability of each QI in community practice and the acceptability of a potential payment link. An indicator score of 0–3 was deemed not acceptable, 4–6 uncertain acceptability and 7–9 acceptable.

Rating results were tabulated, and substantial disagreement between QIs was identified by first applying an absolute measure and, secondly, a relative measure, as outlined by Normand and colleagues (1998). These were defined and applied as follows:

Absolute measure: Any indicator with an observed range of the overall rating of 8 was considered a "disagreeing" quality indicator (i.e., one panelist gives the QI a 1 and another gives it a 9). After we removed the disagreeing QIs using the absolute measure, the relative measure was applied to those remaining.

Relative measure: For each measure *i*, the coefficient of variation (CV) across the raters was calculated:

$$CV_i = \frac{\text{Standard deviation}_i}{\text{Mean}_i}$$

The observed CV_i values were ordered from smallest to largest, and measures corresponding to the top 20% of CV_i values were considered rated with substantial disagreement.

The second round of the modified Delphi process involved a face-to-face meeting of panel members to discuss QIs that were rated with substantial disagreement. Each member was confidentially provided a copy of his or her own rating for each QI, as well as the location of the member's response relative to the overall distribution of the group. With the help of a moderator, the group discussed each QI where disagreement was evident. After the discussion, participants confidentially re-evaluated these QIs and results were again tabulated. Using the final mean score rank, an ordered list of the 35 QIs was produced, from the most acceptable to unacceptable.

Written comments from panel members were compiled from both stages of the Delphi process and combined with research team members' field notes from the face-to-face meeting. Two of the investigators coded these comments and field notes. From these, common themes relating to the principles that participants felt were relevant to the concept of acceptability (both as a measure of quality and as acceptable to link to a payment strategy) were identified and are discussed below.

Findings

Eighteen people participated in the Delphi survey process: 10 family physicians, five nurses/nurse practitioners and three decision-makers. All healthcare providers were currently in practice. Family physicians were primarily male (70%); nurses/nurse practitioners were all female. The majority (67%) practised in an urban setting and represented a variety of practice types (solo, group, community health centres, academic). Decision-makers represented provincial, regional and professional levels. Of those who participated in the survey process, 16 attended the face-to-face meeting to discuss QIs with disagreement.

Quality indicator acceptability

The first Delphi survey round resulted in agreement being reached among 18 QIs, leaving 17 ranked with substantial disagreement. These latter QIs were brought forward for discussion and re-rated in the face-to-face meeting.

Appendix A lists each of the original 35 proposed QIs by its final rank order. Mean scores ranged from a high of 8.1 (screening for modifiable risk factors in adults with diabetes) to 2.7 (asthma control). Nineteen QIs were ranked as acceptable, with a final mean score of >7.0.

The final set of 19, ranked by acceptability as a QI within an area of focus, can be found in Table 1. The majority of acceptable QIs were process-oriented performance indicators with a focus on prevention. Ten QIs assessed primary prevention strategies, four examined secondary prevention performance, four were proxy outcomes (two indicating treatment had been given and two indicating clinical targets were met) and one was a patient safety QI.

Coding of the written comments and the face-to-face discussion provided insight into principles that were associated with an acceptable QI. Key principles included a QI being evi-

TABLE 1. Ranking and rating of accepted PHC quality indicators by area of focus

Indicators by area of focus:	Rank	Indicator acceptability	Payment linkage acceptability
		Mean score (SD)	
Prevention			
Primary prevention			
Childhood immunization (CIHI44)*	2	7.9 (0.9)	7.5 (1.4)
Cervical cancer screening (CIHI50)	5	7.8 (0.9)	7.3 (2.4)
Pneumococcal immunization, 65+ (CIHI42)	6	7.8 (1.2)	7.3 (1.5)
Breast cancer screening (CIHI49)	11	7.6 (1.3)	7.1 (1.6)
Bone density screening (CIHI51)	12	7.5 (1.1)	7.4 (1.1)
Dyslipidemia screening for men (CIHI53)	13	7.4 (1.3)	7.2 (1.4)
Influenza immunization (CIHI41)	14	7.4 (1.8)	7.3 (1.7)
Blood pressure testing (CIHI54)	16	7.3 (1.3)	7.1 (1.5)
Colon cancer screening (CIHI48)	18	7.1 (1.7)	6.7 (1.9)
Dyslipidemia screening for women (CIHI52)	19	7.0 (1.8)	6.7 (1.6)
Secondary prevention			
Screening for modifiable risk factors in adults with diabetes (CIHI57)	1	8.1 (0.8)	7.6 (1.3)
Screening for modifiable risk factors in adults with coronary artery disease (CIHI55)	3	7.9 (1.2)	7.5 (1.3)
Screening for modifiable risk factors in adults with hypertension (CIHI56)	9	7.7 (1.5)	7.2 (1.7)
Screening for visual impairment in adults with diabetes (CIHI58)	10	7.7 (1.5)	6.8 (1.8)
Outcomes			
Treatment of dyslipidema (CIHI61)	4	7.9 (1.5)	7.5 (1.5)
Blood pressure control for hypertension (without diabetes or renal failure) (CIHI40)	7	7.7 (0.9)	6.2 (1.8)
Glycaemic control for diabetes (CIHI39)	15	7.3 (1.1)	5.1 (2.5)
Treatment of congestive heart failure (CIHI60)	17	7.1 (1.5)	7.1 (1.6)
Patient Safety			
Maintaining medication and problem lists in PHC (CIHI70)	8	7.7 (1.5)	6.8 (2.0)

* CIHI #: Indicates the Canadian Institute for Health Information numbered PHC indicator

dence-based, easy to measure, clearly worded, having clearly defined criteria (e.g., specific operational definitions, standardized screening tools, objective values to reach) and the ability to clearly identify the patient population of interest and patient exclusions. There was a favourable sense that QIs acting as a reminder to the provider not to overlook care were better regarded (e.g., a prompt to provide pneumococcal immunization). The primary concerns associated with whether a QI was deemed acceptable seemed to centre on whether it assessed an outcome versus a process. Some providers felt that they could only counsel or advise but did not have the power to control compliance. One example of this situation is the process of advising dietary changes but not being responsible for the final dietary patterns of the individual.

Comments were also made that PHC providers may not have access to tools to help achieve a QI target, such as an electronic medical record that can extract practice-level data. Other factors influencing the acceptability of a QI to our panel included whether the QI was under PHC control (e.g., breastfeeding and its many community and societal influences), the timeliness of evidence supporting the QI, the need for adjustments in QI achievement based on differing practice population characteristics, the impact of co-morbidity burden on QI achievement, and whether the QI focused on the provider's behaviour versus "system" or "organization" capabilities. QIs that focused on system capabilities tended not to be well understood or favoured by the majority of panel members. One system QI seen as challenging was "implementation of PHC clinical quality improvement initiatives." Its definition – "the percentage of PHC organizations who implemented at least one or more changes in clinical practice as a result of quality improvement initiatives over the past 12 months" – was seen to be one that a region or health authority would be rated on rather than an individual practice. This indicator received an average score of 5.4 (SD 2.7).

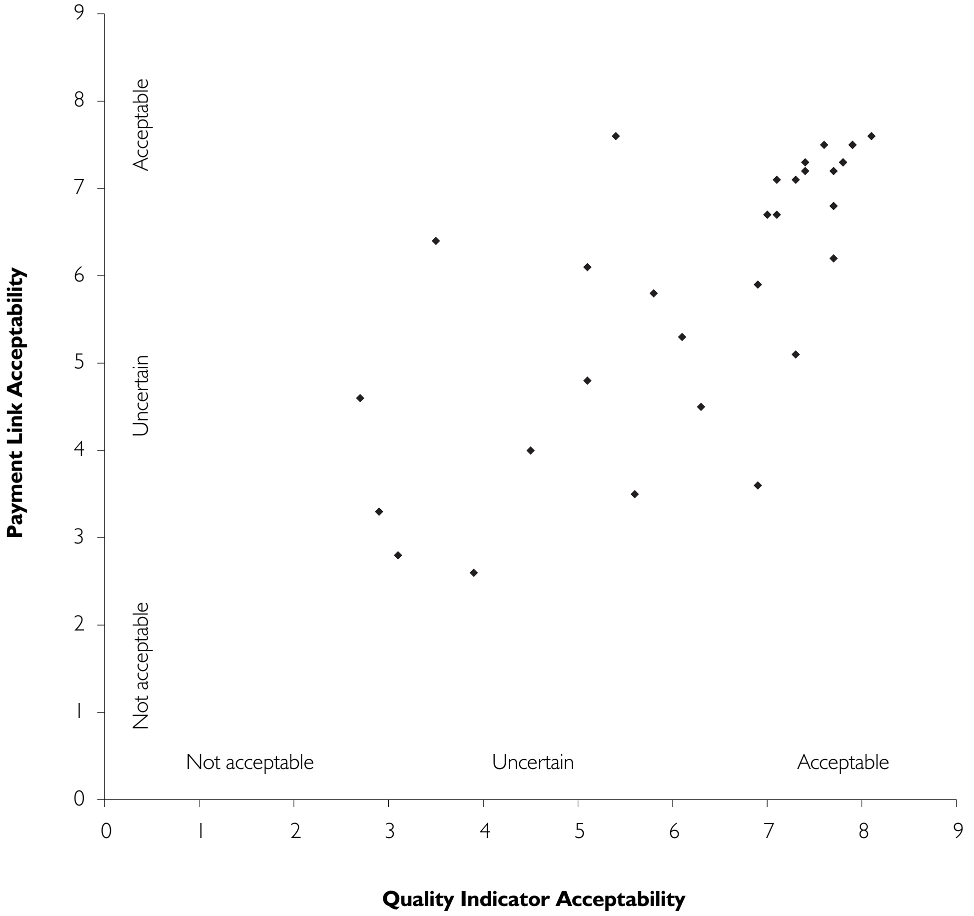
Payment link acceptability

In the first round of the Delphi survey, agreement was reached for 16 QIs on linking a QI to payment, leaving 19 QIs rated with disagreement to be discussed and re-rated in the second-stage face-to-face meeting.

Table 1 includes the final rating score for linking a QI to payment for each of the top 19 QIs identified as most acceptable indicators of quality. Mean rating scores ranged from a high of 7.6 (screening for modifiable risk factors in adults with diabetes) to a low of 5.1 (glycaemic control for diabetes). The rank order in this table is directed by the score for the acceptability of the QI itself as an indicator of quality of care and not a ranking of acceptability to payment linking. Linking payment to the achievement of a potential QI was of secondary importance in this first phase of the project. At this stage, the acceptability of the QI, as a measure of quality of care itself, was of primary interest. In the third phase of the project payment, link ratings associated with the most acceptable *and* feasible QIs from the first two phases will be provided greater focus.

Figure 1 illustrates the relationship between the acceptability ratings for the QI itself and the associated acceptability rating for a payment link of all 35 QIs initially ranked. Although a moderate positive linear relationship can be seen (Pearson correlation coefficient $r=0.74$), variability is evident. Most QIs rated as acceptable indicators of quality of care (>7.0) tended also to score higher with respect to the acceptability of a payment link. The primary exceptions were associated with QIs assessing such performance outcomes as blood pressure control for hypertension (CIHI 40) and glycaemic control for diabetes (CIHI 39), where the acceptability of a payment link was rated relatively lower than that for the QI itself.

FIGURE 1. The relationship between quality indicator acceptability and payment link acceptability ratings (mean scores)



In the analysis of the qualitative comments made by panelists on the surveys and in the face-to-face meeting, a number of concerns were raised with respect to linking payment to the achievement of a QI. Concerns were voiced about whether PHC practitioners should receive additional incentives for what is considered the standard of care. Some panelists did not feel they should be paid more to do what they are already doing, or should be doing. Panelists also expressed the need to be able to adjust the denominator to account for patients who refuse care or those with contraindications. Because all practice populations are not the same, for some, the patient mix would make achieving the indicator more challenging. Thus, having the ability to account for patient mix was thought important. This same point was made in the comments regarding the acceptability of some indicators as valid measures of quality of care (see above).

Panelists felt that striving to achieve QI targets has the potential to interfere with the provider–patient relationship by forcing attention away from patient agendas to only those issues that increased income for the provider.

Similar to the assessment of acceptability for quality of care, some QIs, such as those assessing outcomes and others requiring tests not readily available, were felt to be beyond providers' control.

A number of concerns pertaining to "gaming" were raised. Some felt that financial incentives to achieve QIs could lead some providers to select new patients based on their conditions while also encouraging others with "undesirable" conditions to leave the practice.

Additional questions were raised about the sharing of responsibility for a patient with other providers (i.e., which provider would receive the incentive), management of QI costs, documentation of offer or advice, and achieving percentage of change versus absolute change and group versus individual targets. Overall acceptability of a payment link (and the QI itself) was rejected if the QI was felt to be poorly defined or the wording of the QI implied that treatment required an incentive following diagnosis (e.g., was the patient diagnosed with depression offered treatment).

Discussion

Overall, 19 of the initial 35 QIs were ranked as acceptable measures of quality of care (>7.0). Fourteen of these were associated with prevention strategies (10 primary prevention, four secondary), four were outcomes and one was a patient safety QI. We were encouraged to see the clear link in our panelists' thinking between what they ranked as acceptable QIs and those QIs considered acceptable to link to payment strategies. If a cut-off mean score of 7.0 or greater in the ratings of "acceptability to payment linkage" was also applied, our final QI set would reduce to 13 items. Our study team has, however, retained the 19 for the initial feasibility work to be conducted in phase two of this study. The integration of the payment rating findings will be used in phase three.

The finding of general enthusiasm for QIs, particularly among providers, is not unique to the Canadian setting (Young et al. 2007). However, this enthusiasm predates actual experience with performance measurement strategies, and once these are implemented, concerns tend to follow (Greene and Nash 2008). The types of concerns expressed by our panelists are similar to those found in the literature. Specifically, these concerns include the challenges of creating clear operational definitions, the ability to identify the numerator and denominator from practice records, where the "majority of control" of achieving the QI rested (with provider or patient) and the ability to adjust achievement by patient characteristics. The identification of preference given to QIs based on process activities rather than outcomes has led some proponents to suggest that incentive strategies might best be constructed around a combination of these two types of measures (Lilford et al. 2007). The indicators removed from consideration, if not used, may lead to possible performance incentive strategies that may avoid a number of issues, ranging from medication use for chronic conditions (asthma, myocardial infarction, depression and anxiety), to well child care (breastfeeding, injury prevention, well baby screening), to some practice organization issues (quality improvement initiatives, medication incident reduction). It is important to remember that the reasons for our panel's excluding an indicator may not reflect the perception of the validity of the issue, but rather the views on ability to measure the indicator with any perceived accuracy.

Linking the use of QIs to payment strategies, generally known as pay for performance (P4P), is relatively new in the Canadian setting. Early efforts are underway in British Columbia, Ontario and Nova Scotia, where payment for chronic disease care and some prevention strategies is underway (British Columbia Ministry of Health 2006; OMHLTC 2009). Our findings lend support for potential payment mechanisms. Our participant providers and decision-makers agree that some QIs are acceptable as valid measures and also warrant incentive financial strategies. Following the second phase of our study, which examines the feasibility of obtaining EMR information to populate the 19 indicators deemed most acceptable in this phase one, we will bring together the results of these two phases to fully explore acceptable funding mechanisms for what we believe will likely be an even smaller QI set.

As the use of quality or performance indicators unfolds in PHC in Canada, it will require general acceptance by different stakeholders. In evaluating the technical effectiveness of the quality of PHC using these QIs, the necessary stakeholders will comprise both healthcare providers (family physicians, nurses, nurse practitioners, pharmacists, dietitians and others) and funder decision-makers (such as provincial ministries of health, who pay for the health services provided). It is essential to understand which measures achieve a sense of acceptability to the providers and funders and, more broadly, the principles or characteristics that underlie a measure's inherent acceptability for future work. Patient participation in assessing the acceptable QIs has begun in the United Kingdom but has not been that successful (Murie and Douglas-Scott 2004).

Performance measurement or management – the broader strategy in which the use of QIs is but one component – is a challenging area in healthcare delivery today. Although having varying definitions, it is generally thought to include four stages: (1) conceptualization, (2) selection/development of measures (the QIs), (3) data collection and processing, and (4) the reporting and use of the results (Adair et al. 2006). The intent is to serve two main purposes: to improve quality and to promote accountability (Freeman 2002). Our study has sought only to provide information on what the participants considered an acceptable, manageable set of measures (the QIs) for consideration in a performance management approach in primary care given a rather large set developed by a national organization (CIHI 2006c). Using such indicators in a performance management approach has both intended consequences (improvements in quality of care, outcomes for specific situations or both) and unintended ones (exclusion of some conditions, situations; focus on building better measures and ignoring underlying process; gaming, blaming and lowering morale) (Freeman 2002). The United Kingdom and private healthcare organizations in the United States have been experiencing these issues and are modifying their approaches to minimize them.

Limitations

As with all Delphi processes, it is important to consider the limitations. The participating panelists were purposively chosen to achieve a range of opinions. They may not represent the majority view of all PHC providers and decision-makers. In addition, the work was conducted in Nova Scotia, the context of which finds electronic medical record uptake in the order of 30% of family practices and which has not seen "structured, pre-defined" new models of PHC delivery as in other Canadian provinces (such as family health teams in Ontario, family medicine groups in Quebec or primary care networks in Alberta).

Conclusion

The findings of our study provide important evidence of the acceptability to health providers and funders of a small set of QIs and of their views of linking payment to performance on these QIs. Steps are now underway in phase two of our research to examine the ability to extract data from electronic records in primary care practices. This second phase of our study will report on the feasibility of finding the data to populate the 19 QIs deemed acceptable. Other related efforts are underway across the country in order to move the measurement issues forward. A critical large-scale effort is the Canadian Primary Care Sentinel Surveillance Network (2009), funded by the Public Health Agency of Canada, which is focused on chronic disease surveillance in primary care using electronic medical records. Until we are confident that our measurement of the QIs is achievable, linking pay to performance will be difficult to implement.

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ONLINE EXCLUSIVE

Are Primary Healthcare Organizational Attributes Associated with Patient Self-Efficacy for Managing Chronic Disease?

Les caractéristiques organisationnelles des établissements de première ligne sont-elles associées aux autosoins chez les patients atteints de maladies chroniques?

VALÉRIE LEMIEUX, JEAN-FRÉDÉRIC LÉVESQUE AND DEBBIE EHRMANN-FELDMAN

Abstract

Our objective was to explore how individual and primary healthcare (PHC) organizational attributes influence patients' ability in chronic illness self-management. We conducted a cohort study, recruiting 776 adults with chronic disease from 33 PHC settings in the province of Quebec. Organizational data on the PHC clinics were obtained from a prior study. Participants were interviewed at baseline, 6 and 12 months, responding to questionnaires on self-efficacy, health status, socio-demographics, healthcare use and experience of care. Multilevel modelling showed that 52.5% of the variance in self-efficacy occurs at the level of the individual and 4.0% at the organizational level. Controlling for diagnosis, patient factors associated with self-efficacy were self-rated health (B coeff 0.76: CI 0.60; 0.92), concurrent depression (B coeff –1.41: CI 1.96; –0.86) and satisfaction with care (B coeff 0.27: CI 0.15; 0.39). None of the organizational attributes was significantly associated with self-efficacy after adjusting for lower-level variables. Patients generally reported receiving little self-management teaching across organizations.

Résumé

L'objectif était d'explorer l'influence des facteurs individuels et des caractéristiques organisationnelles des établissements de première ligne sur les autosoins de maladies chroniques. L'étude portait sur 776 patients adultes atteints de maladie chronique et suivis dans 33 établissements de première ligne dans la province de Québec. Les données organisationnelles des cliniques de première ligne provenaient d'une étude antérieure. Les participants ont été interrogés au début de l'étude, puis après 6 et 12 mois, au moyen d'un questionnaire portant sur les autosoins, l'état de santé, les données sociodémographiques, l'utilisation des services et leur expérience en matière de services de santé. Une modélisation multiniveaux montre que 52,5 % de la variance d'autosoins se situe au niveau de l'individu et 4,0 % au niveau des cliniques. En contrôlant pour le diagnostic principal, les autres facteurs influents sont le niveau de santé perçu (coeff. 0,76: CI 0,60; 0,92), la co-occurrence d'une dépression (coeff. –1,41: CI 1,96; –0,86) et la satisfaction envers la source de soins (coeff. 0,27: CI 0,15; 0,39). Après avoir ajusté le modèle, aucune caractéristique organisationnelle n'apparaît significativement associée aux autosoins. Les patients indiquent généralement qu'ils reçoivent peu de formation en autosoins de la part des organisations.

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ONLINE EXCLUSIVE

A Global Approach to Evaluation of Health Services Utilization: Concepts and Measures

Approche globale d'évaluation de l'utilisation de services de santé : concepts et mesures

ROXANE BORGÈS DA SILVA, ANDRÉ-PIERRE CONTANDRIOPOULOS,
RAYNALD PINEAULT AND PIERRE TOUSIGNANT

Abstract

Health services utilization has been the object of many books and papers in the literature. Measures associated with utilization are often a function of volume of services. The objective of this paper is to present a comprehensive approach to the evaluation of health services utilization and of associated measures, using databases. Based on the theoretical framework of Starfield (1998), we analyze health services utilization with the help of indicators that are not directly linked to volume but that indirectly provide an estimate, while also documenting the qualitative aspects of utilization. The indicators mark accessibility, continuity, comprehensiveness and productivity of care. Once the concepts have been defined, we propose their operationalization using the databases. We then present the advantages of multidimensional conceptualization of health services utilization through a simultaneous analysis of these indicators. Researchers and decision-makers in public health and health planning have much to gain from this innovative multidimensional approach, which presents a dynamic conceptualization of health services utilization based on health administrative data.

This paper was originally published in French, in the journal *Pratiques et Organisation des Soins* 2011 42(1): 11–18.

Résumé

Dans les nombreuses publications sur l'utilisation des services de santé, les mesures portent le plus souvent sur le volume de services. L'objectif de cet article est de présenter une approche globale d'évaluation de l'utilisation des services de santé de première ligne, et des mesures qui y sont associées à partir des banques de données. En nous basant sur le cadre théorique de Starfield (1998), nous proposons d'analyser l'utilisation des services à l'aide d'indicateurs qui ne sont pas directement liés au volume, mais qui indirectement en donnent une approximation, tout en documentant les aspects qualitatifs de l'utilisation. Ces indicateurs relèvent de l'accessibilité, la continuité, la globalité, et la productivité des soins. Après avoir défini chacun des concepts, nous en proposons leur opérationnalisation à partir des bases de données. Nous présentons ensuite l'intérêt de cette conceptualisation multidimensionnelle de l'utilisation des services à l'aide de l'analyse simultanée de ces indicateurs. Les chercheurs et décideurs en santé publique et en planification de la santé trouveront avantage dans l'utilisation de cette approche multidimensionnelle novatrice. Elle offre une conceptualisation de l'utilisation des services de santé dynamique en s'appuyant sur des bases de données médico-administratives.

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Abstract

Our objective was to explore how individual and primary healthcare (PHC) organizational attributes influence patients' ability in chronic illness self-management. We conducted a cohort study, recruiting 776 adults with chronic disease from 33 PHC settings in the province of Quebec. Organizational data on the PHC clinics were obtained from a prior study. Participants were interviewed at baseline, 6 and 12 months, responding to questionnaires on self-efficacy, health status, socio-demographics, healthcare use and experience of care. Multilevel modelling showed that 52.5% of the variance in self-efficacy occurs at the level of the individual and 4.0% at the organizational level. Controlling for diagnosis, patient factors associated with self-efficacy were self-rated health (B coeff 0.76: CI 0.60; 0.92), concurrent depression (B coeff –1.41: CI 1.96; –0.86) and satisfaction with care (B coeff 0.27: CI 0.15; 0.39). None of the organizational attributes was significantly associated with self-efficacy after adjusting for lower-level variables. Patients generally reported receiving little self-management teaching across organizations.

Résumé

L'objectif était d'explorer l'influence des facteurs individuels et des caractéristiques organisationnelles des établissements de première ligne sur les autosoins de maladies chroniques. L'étude portait sur 776 patients adultes atteints de maladie chronique et suivis dans 33 établissements de première ligne dans la province de Québec. Les données organisationnelles des cliniques de première ligne provenaient d'une étude antérieure. Les participants ont été interrogés au début de l'étude, puis après 6 et 12 mois, au moyen d'un questionnaire portant sur les autosoins, l'état de santé, les données sociodémographiques, l'utilisation des services et leur expérience en matière de services de santé. Une modélisation multiniveaux montre que 52,5 % de la variance d'autosoins se situe au niveau de l'individu et 4,0 % au niveau des cliniques. En contrôlant pour le diagnostic principal, les autres facteurs influents sont le niveau de santé perçu (coeff. 0,76: CI 0,60; 0,92), la co-occurrence d'une dépression (coeff. –1,41: CI 1,96; –0,86) et la satisfaction envers la source de soins (coeff. 0,27: CI 0,15; 0,39). Après avoir ajusté le modèle, aucune caractéristique organisationnelle n'apparaît significativement associée aux autosoins. Les patients indiquent généralement qu'ils reçoivent peu de formation en autosoins de la part des organisations.

Chronic illness has become the first cause of premature death and accounts for 50% to 80% of all healthcare expenditures in some countries (WHO 2008; Yach et al. 2004). While the nature of chronic conditions implies continuous management, our healthcare systems provide only a fraction of the care needed by persons with these health problems (Commissaire à la santé et au bien-être 2010). Increasing patients' self-management competencies has thus become paramount in chronic care (Kreindler 2009).

Self-management program participants generally report positive results (Chodosh et al. 2005; Effing et al. 2007; Warsi et al. 2004), and a reduction in healthcare utilization has been observed (DeWalt et al. 2006; Lorig et al. 2001). There is, however, little evidence of sustained results over time, although recent findings suggest that certain gains could be maintained up to eight years post-intervention (Barlow et al. 2009). An ongoing support mechanism may be necessary to ensure long-term adherence to self-management guidelines and to keep patients motivated. Yet, most self-management interventions remain concentrated in episodic programs and are seldom integrated into mainstream primary healthcare (PHC) (Kreindler 2009). Because PHC organizations are responsible for care and follow-up of patients with chronic conditions, they represent an ideal setting for the provision of timely and tailored self-management education and support.

Strategies to incorporate self-management into PHC, such as written information, meetings with a nurse or health educator, follow-up calls, telemonitoring or newsletters, have not had consistent results on health outcomes, although improvements in self-management knowledge and techniques have been reported (Eakin et al. 2007; Jordan and Osborne 2007; McGeoch et al. 2006; Trappenburg et al. 2008; Wood-Baker et al. 2006). Integration of self-management support into existing care appears more effective if combined with organizational strategies such as reimbursement policies, a multidisciplinary approach and appropriate training for clinicians (Blakeman et al. 2006; Commissaire à la santé et au bien-être 2010; Dennis et al. 2008; Harris et al. 2008). Evidence also suggests that organizational characteristics such as a higher practice volume, multidisciplinary care teams and use of information technology (reminder systems, patient registries) have a positive impact on the delivery of preventive services and self-management interventions (Crespo and Shrewsberry 2007; Hung et al. 2006; O'Connor et al. 2008). However, research is scarce in this area, and is needed to guide changes in organizational structures and resources that can foster patient self-management.

The main goal of this observational study was to explore the links between PHC organizational characteristics and patients' confidence in their capacity to manage a chronic illness. Secondary objectives were to identify individual variables that influence confidence for self-management and to document the variations in perceived ability for self-management over a 12-month period.

Methods

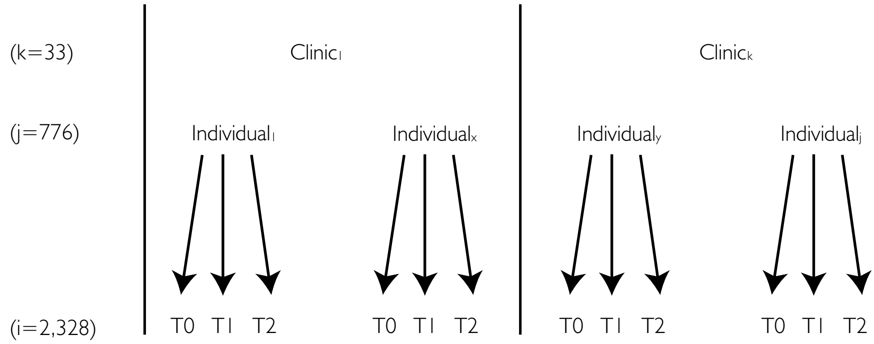
Research design and theoretical background

The theoretical model for this study hypothesizes that self-efficacy for managing chronic disease is influenced by organizational factors or attributes, as well as individual factors and health services utilization. Organizational attributes comprised four core dimensions that are thought to define an organization and its activities: shared values, available resources, organizational structures and common practices (Pineault et al. 2008). Based on combinations of these attributes, Quebec PHC organizations can be classified into four models of PHC practice: (1) community practice, (2) family medicine group, (3) private group practice or (4) solo provider. A thorough definition of each of these models is included in Appendix A.

Data source and sample

This longitudinal study used data collected in two previous studies, the Accessibility Survey and the MaChro Study. The former is a survey conducted in 2005 that targeted all PHC practices in two healthcare administrative regions of the province of Quebec in order to document their organizational attributes (Pineault et al. 2008). Of the surveyed organizations, 90 clinics providing chronic care and representing the different types of PHC practices were selected to participate in the MaChro Study, a research project on PHC organization and chronic disease management. Patients (n=776) 18 years of age or older were recruited in 33 PHC settings. All were recruited in clinical settings, had a primary diagnosis of chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), diabetes or chronic arthritis, and were being followed in their clinic for at least six months. A definition of the inclusion diagnoses and the distribution of participants' characteristics across the various models of PHC clinics are given in Appendix B. Participants were interviewed three times: at inception, in a face-to-face interview (T0) and subsequently in two telephone interviews at six (T1) and 12 months (T2). Figure 1 displays the study design. In both the Accessibility and MaChro studies, participants gave informed consent. The present study protocol was approved by the University of Montreal's Research and Ethics Committee.

FIGURE 1. Data structure



Measures

Each of the three interviews included questionnaires on self-efficacy, health-related factors, socio-demographics, healthcare utilization and experience.

SELF-EFFICACY FOR CHRONIC ILLNESS SELF-MANAGEMENT

Self-Efficacy for Managing Chronic Disease scales (Lorig et al. 1996) were used to assess patients' perceived ability for self-management. On a scale from 1 (not at all confident) to 10 (totally confident), participants were asked how confident they are in managing various aspects of their condition such as fatigue, discomfort and emotional distress. Two scales were administered: the Self-Efficacy for Managing Chronic Disease Six-Item Scale (general self-efficacy) and the Self-Efficacy to Control/Manage Depression Scale (mental self-efficacy). Both have shown strong internal consistency (Lorig et al. 1996).

PHC ORGANIZATIONAL ATTRIBUTES

Organizational attributes for the 33 recruiting clinics were obtained from the Accessibility organizational survey database. We selected variables that reflected each of the core organizational dimensions as defined by the study framework (Hung et al. 2006; Pineault et al. 2008). Selection was also guided by the Chronic Care Model (CCM) to identify organizational elements that could enhance successful implementation of patients' self-management support (Hung et al. 2006). The CCM is based on six coordinated dimensions of effective chronic care: system delivery design, clinical information systems, healthcare organization, decision support, community links and self-management support, which emphasizes patient involvement and encompasses various strategies such as patient teaching, systematic follow-ups and greater linkage with community resources (Wagner et al. 2001). Whenever possible, organizational variables were dichotomized based on achieving or not achieving established benchmarks to create one binary variable. When this was not feasible, composite scores were created to provide a summary measure of related organizational items. For example, questions on walk-in service hours, schedules, telephone services and emergency line access were aggregated to provide a three-category measure of accessibility–accommodation, a composite variable described by Haggerty and colleagues (2007).

INDIVIDUAL VARIABLES

Socio-demographic data were collected from the study questionnaire. Baseline health-related information consisted of PHC affiliation model (solo provider, family medicine group, community practice, group practice) and main diagnosis. Number of co-morbidities, including concurrent depression, was also recorded at baseline by providing a list of conditions and asking participants if they currently had the given condition.

Self-rated health was measured on a scale from 1 (bad) to 5 (excellent). Number of medical visits in the preceding year and overall satisfaction with provider were also recorded at baseline.

DATA ANALYSIS

First-stage data analyses were done using SPSS 12 (SPSS 2003). Because of the hierarchical nature of the data (Figure 1), a tri-level model was constructed for each self-efficacy outcome (general and mental) to examine key relationships with repeated measures (T0, T1 or T2) at level one, individual characteristics at level two and organizational factors at level three. All multilevel analyses were conducted using HLM 6 (Raudenbush et al. 2004). Variance components were first examined in an intercept-only model to determine the amount of total variation in the outcome that is attributable to each level of predictors. Next, in a random intercept model, selected predictors were entered in sequence. To keep models parsimonious, only covariates that were judged conceptually or clinically important were chosen from those that appeared as significant correlates of self-efficacy in earlier bivariate analyses. Continuous predictors were centred on their mean. Final models included a random slope (allowed to vary across patients) and a cross-level interaction between slopes and self-rated health (i.e., slopes allowed to vary differently across levels of self-rated health). All models controlled for age, sex and inclusion diagnosis.

Results

Patients' self-efficacy was generally high, with frequency distributions positively skewed (baseline mental self-efficacy mean=7.65, SD=2.00; general self-efficacy mean=6.78, SD=2.09). Table 1 describes baseline individual characteristics. The study sample included a broad age range (22–97, with mean=67.13) and was distributed across all socio-demographic categories.

TABLE 1. Sample characteristics (n=776)

Characteristics	%
Male	44.7
Inclusion diagnosis	
Arthritis	27.2
CHF	19.3
Diabetes	33.2
COPD	20.2
Co-morbidity: ≥6 illnesses at baseline	25.1
Depression	9.7
Education level	
6 years or less	23.2
7–11 years	52.5
12 years or more	24.4
Yearly income	
Less than $15,000	19.4
$15–35,000	43.4
$35–75,000	28.0
More than $75,000	9.1
Self-rated health	
Bad	7.2
Fair	25.8
Good	40.3
Very good	19.8
Excellent	6.3
≥4 medical visits in the preceding year	72.7
Satisfaction with care	
Highly satisfied	83.8
Moderately satisfied	13.4
Neutral or dissatisfied	2.8

Five hundred and ninety-eight participants (77.1%) responded to all of the three study phases. Non-respondents did not significantly differ from respondents with regard to health status, diagnosis, healthcare utilization, type of PHC clinic and baseline levels of self-efficacy, but were more likely to have a greater number of co-morbidities at baseline (p=0.034).

Table 2 describes attributes of the clinics that are consistent with chronic illness self-management support based on the CCM, along with associated group self-efficacy mean scores. These unadjusted bivariate results revealed that several of the characteristics that are viewed as valuable tools for self-management support were in fact negatively associated with self-efficacy for managing chronic illness. Clinics reporting a multidisciplinary practice had lower mean patient self-efficacy scores than clinics operating with GPs only (p=0.012 and 0.006). The use of clinical information systems such as electronic medical records, patient registries or the Quebec health communication network (RTSS) also translated into lower levels of self-efficacy among patients (p<0.005). A fee-for-service GP remuneration model was linked with higher self-efficacy scores than salary-based models (p<0.005).

TABLE 2. Bivariate relationships between PHC clinics' attributes according to CCM and patient confidence for chronic illness self-management

CCM dimensions	PHC attributes	General self-efficacy	Mental self-efficacy	Clinics (%)
Healthcare organization	Practice size (number of full-time equivalent GPs)			
	Solo	6.98	8.13	15.2
	2–5	6.83	7.72	30.3
	<5	6.71	7.54	54.5
	GP payment model			
	Salary-based or mixed	6.47**	7.33**	34.5
	Fee-for-service	6.93	7.82	65.6
System delivery design	Multidisciplinary practice			
	Yes	6.62**	7.48**	59.4
	No	7.01	7.89	40.6
	Number of nurses working in the clinic			
	None	7.01**	7.8**	40.6
	1	6.85	7.73	28.1
	2–5	6.68	7.67	12.5
	>5	6.24	6.99	18.8
	Nurses play an expanded role[1]			
	Yes	6.26**	7.28**	31.6
	No	6.86	7.71	68.4
	Clinical coordination mechanisms[2]			
	Formal	7.02	7.56	43.8
	Informal or none	7.72	8.08	56.3
Clinical information system	Use of clinical information systems[3]			
	Yes	6.71**	7.54**	58.0
	No	6.95	7.83	42.0

TABLE 2. Continued

Self-management support	Preventive practices integration in routine care			
	Fully integrated	6.86	7.68	84.4
	Not fully integrated	6.76	7.82	15.6
	Available written information on disease management / health habits			
	Yes	6.85	7.72	84.4
	No	6.85	7.57	15.6
Community links	Vulnerable patients are referred to specific networks			
	Yes	6.87	7.73	68.8
	No	6.59	7.49	31.3
Decision support	Clinical guidelines adherence			
	Greatest importance	6.66	7.58	28.1
	Other	6.79	7.66	71.9
	Formal mechanism of quality control at the organization level			
	Yes	6.64	7.52	61.8
	No	6.82	7.66	39.2

[1] Expanded role includes systematic follow-up of clienteles, coordination of care, involvement in clinical decisions and patient teaching.

[2] All items addressing clinical coordination mechanisms were used to create one binary variable scored 0 (no formal coordination system) or 1 (at least one formal mode of clinical coordination in the clinic).

[3] Clinics that used at least 2 of the following (electronic medical records, patient registries, access to the Quebec health system electronic network) were considered to meet the requirements.

General self-efficacy for managing chronic disease

The final multilevel model for self-efficacy is presented in Table 3. Results from the intercept-only model (not shown) indicated that the largest variance component was at the level of the individual, with an intra-class correlation (ICC) of 0.536. This means that variations among individuals accounted for 53.6% of the total variance in general self-efficacy for managing chronic illness. Repeated measures and clinics accounted for 43.6% and 3.7%, respectively, of this variance.

For final estimates of the fixed effects, the slope coefficient represents the mean rate of change in self-efficacy that is associated with repeated measures. Results suggest a modest but significant average growth in self-efficacy over time (B=0.096; 95% CI [0.088; 0.174]).

Individual and organizational coefficients describe the mean difference in self-efficacy general scores that is associated with a unit change in patient or clinic characteristics. Adjusting for time, and controlling for diagnosis, age and sex, a high satisfaction with care was found to be positively associated with general self-efficacy (B=0.27 [0.15; 0.39]). On the other hand, six or more co-morbidities as well as a greater number of consultations with providers in the preceding year were associated with lower self-efficacy scores (B=−0.74 [−1.03; −0.45]) and B=−0.21 [−0.33; −0.09], respectively). The single most important predictor of general self-efficacy was self-rated health (B=0.76 [0.60; 0.92]), which also explained 45% of the clinic-level self-efficacy variance, suggesting that patients differed considerably from clinic to clinic in terms of personal and health factors. Self-rated health was also found to interact with the time variable (repeated measures) in a negative way (B=−0.15; [−0.23; −0.08]), meaning that the contrast between patients with good and poor health tends to fade over time.

After adjustment for lower-level variables, none of the organizational attributes was shown to significantly influence levels of self-efficacy or to modify its rate of change.

For the random effects, variance estimates for self-efficacy random slopes were significant among individuals (p=0.009), meaning that rates of change in self-efficacy vary from person to person. The full model accounted for an overall 36% of variance in self-efficacy.

Self-efficacy for managing depression in chronic disease (mental self-efficacy)

For mental self-efficacy (Table 3), the largest variance component was also observed at the individual level with an ICC of 0.581. Occasions and clinics accounted for 38.3% and 3.5%, respectively, of this variance.

Final estimates of the fixed effects indicated no direct effect of time on average growth or decline in mental self-efficacy. Again, none of the organizational variables was shown to influence mental self-efficacy after adjusting for lower-level factors.

The individual-level predictors of self-rated health, satisfaction with care and number of consultations with provider in the preceding year were significantly associated with mental self-efficacy after adjusting for time and controlling for age, sex and primary diagnosis. The presence of a co-occurring depression had the strongest direct effect, with an average reduction of 1.41 points on a 10-point scale in mental self-efficacy scores when patients reported suffering from depression or burnout (B=−1.41 [−1.96; −0.86]). The interaction term of repeated measures with self-rated health also appeared significant (B=−0.13 [−0.19; −0.07]). Partition of the variance in the full model indicates that individual factors explained about 28% of mental self-efficacy differences across patients and nearly 45% of the differences between clinics, again suggesting that clienteles differ considerably from clinic to clinic in terms of personal and health characteristics.

For the random part, the residual variance indicates that predictors, covariates and random effects included in the full model explained approximately 20% of mental self-efficacy levels and changes over time. As for general self-efficacy, the random slope coefficient was significant among individuals (p=0.008) but not among clinics.

Regression diagnostic measures did not indicate any significant concerns over multicollinearity, influential observations and heteroscedasticity (not shown).

Discussion

This study examined the associations that exist between PHC organizations' attributes and patients' perceived ability in chronic disease self-management. To our knowledge, this is the first study to explore the link between self-management and PHC affiliation by means of a longitudinal design in natural settings. Our results provide empirical evidence that characteristics of PHC organizations explain a small, albeit significant, portion of observed variation in patient self-efficacy for managing chronic disease, but exert little effect compared to individual factors.

TABLE 3. Multilevel analysis of self-efficacy for managing chronic illness

		Full model with interaction General self-efficacy score	Full model with interaction Mental self-efficacy score
	Fixed part	**coeff [95% CI]**	**coeff [95% CI]**
	intercept	6.62 [6.25; 6.99]	7.88 [7.59; 8.17]
Level 3	Multidisciplinary practice (REF=no) – yes	0.04 [–0.19; 0.27]	–0.05 [–0.25; 0.15]
	GP remuneration model (REF=fee-for-service) – salary-based	–0.10 [–0.24; 0.04]	–0.12 [–0.26; 0.02]
	Use of clinical information systems (REF=no) – yes	–0.19 [–0.44; 0.06]	–0.17 [–0.43; 0.09]
Level 2	Satisfaction with care	**0.27 [0.15; 0.39]**	**0.31 [0.13; 0.49]**
	Number of GP visits	**–0.21 [–0.33; –0.09]**	**–0.18 [–0.32; –0.04]**
	Self-rated health	**0.76 [0.60; 0.92]**	**0.60 [0.48; 0.72]**
	Co-morbidities (REF=1or 2) 3 to 5 6 and more	 –0.16 [–0.38; 0.06] **–0.74 [–1.03; –0.45]**	—
	Co-occurring depression (REF=no) – yes	—	**–1.41 [–1.96; –0.86]**
	Age	0.01 [0.002; 0.018]	–0.002 [–0.009; 0.006]
	Sex	0.08 [–0.09; 0.25]	–0.04 [0.256; 0.176]
	Diagnosis (REF=arthritis) – Diabetes – CHF – COPD	 **1.09 [0.87; 1.31]** **0.77 [0.48; 1.06]** **0.43 [0.14; 0.72]**	 **0.38 [0.05; 0.71]** **0.44 [0.19; 0.69]** 0.18 [–0.11; 0.47]
Level 1	Time	**0.096 [0.088; 0.174]**	0.05 [–0.01; 0.11]
	Time X self-rated health	**–0.15 [–0.23; –0.08]**	**–0.13 [–0.19; –0.07]**
Random part (partition of variance)			
Between organizations		0.04	0.036
Between individuals		1.35	1.804
Random effects		0.09	0.184
Between repeated measures		1.55	1.217

p-value < 0.05

Time factor

Little variation in self-efficacy was recorded over study phases, consistent with previous studies showing that the expected mean change for such outcome measures varies between 0.2 to 0.4 times its standard deviation (Lorig et al. 1996; Mazzuca 1982). Although statistically significant, the upward trend found for the general self-efficacy scores remains very modest, and its clinical implication appears tenuous. Complementary analyses on the interaction term showed that people reporting poor health at baseline tended to have more positive changes in self-efficacy than people reporting good to excellent health. This finding likely reflects a ceiling effect; better health associated with higher self-efficacy left little room for further improvement. Although the overall trend was positive, intra-individual self-efficacy scores were found to vary greatly over the study phases. This variance may lead to regression towards the mean and illustrates the value of longitudinal designs to explore how self-efficacy evolves from person to person based on personal history and course of the disease.

Individual factors

No socio-demographic factor was associated with the outcome. Patients who rated their health above average reported significantly higher general as well as mental self-efficacy. Inversely, patients presenting with several co-morbid conditions generally reported lower ability in self-management. Indeed, multi-morbidity results in complex self-management needs; patients having to deal with the compound effects of multiple conditions also face issues of polypharmacy, adherence to numerous (potentially contradictory) treatment plans and overlapping symptoms. Patients who report having the confidence to cope with disease-specific regimens are often overwhelmed by the competing demands of seemingly incompatible multi-morbid self-management tasks (Bayliss et al. 2007, 2003). While our results suggest that a majority of individuals who have a diagnosis of chronic illness also present with two to three co-morbid conditions, efforts should be directed at developing self-management approaches that consider the needs of patients facing multiple illnesses. In particular, we found that 42% of persons with chronic disease developed depression at some point over the course of their disease, and depression is associated with decreased self-management ability (Wells et al. 1988). This finding was echoed in our results. It illustrates the need to address the issue of multi-morbidity, and implies that interventions aimed at promoting self-management should not be standardized; rather, they should be easily adaptable to varying levels of morbidity and the resulting differences in self-management support needs (Commissaire à la santé et au bien-être 2010).

Organizational factors

Given that patients spend, on average, 0.1% of their time in the presence of healthcare professionals (Radcliff-Branch 2009), 4% of explained variance can be regarded as non-negligible and provide valuable insight into how factors that make up an organization's skeleton may help maximize patient–provider encounters to reinforce self-management.

Although there is evidence that organizational attributes affect processes of care and influence patient outcomes (Hogg et al. 2008; Hung et al. 2006, 2007), none of the fixed parameters for the organizational attributes under study was significantly different from zero. Removing the most influential covariates from the models did not change this pattern. This finding may be due to the small organizational sample size (n=33), coupled with a lack of variability between participating clinics: all were approached on the basis of their involvement in chronic illness care and are therefore more geared towards chronic care than the average PHC clinic.

Another likely explanation is that an "in-between level" is missing, that of the provider. Indeed, organizational attributes may not exert a direct influence on patient behaviours but rather modulate providers' behaviours, patient–provider interactions or both. Factors such as availability of allied health professionals, reimbursement policies and practice volume have been shown to influence the ability of clinicians to carry out supportive interventions for self-management (Blakeman et al. 2006). Effective patient–provider communication and a satisfactory relationship were shown to have positive impacts on patients' confidence to manage a chronic condition (Greene and Yedidia 2005). In our study, a measure of satisfaction with care was included, and our data also indicate that high satisfaction is associated with greater perceived ability for self-management, highlighting that the patient–provider relationship must not be lost in broad system redesigns. Although novel modelling approaches are being developed for this purpose, separating the effect of provider behaviours from the effect of the practice environment on patient outcomes remains an important issue for future research.

While regression models did not yield significant results for organizational attributes, significant associations were observed in unadjusted bivariate analyses (Table 2). Moreover, these associations seemed counter-intuitive: specific self-management support mechanisms, such as making educational materials available and implementing preventive care practices (e.g., counselling), did not influence patient self-efficacy for chronic disease self-management. This finding may be attributed to the fact that these interventions are insufficient, and self-management support needs to be integrated into all care processes and practices. This finding underlines the utility of reinforcing linkages with community organizations that promote self-management and the need to develop an ongoing support network for patients living with chronic conditions.

Other counter-intuitive results in unadjusted analyses indicated that multidisciplinary practice, an expanded role for nurses, greater use of clinical information systems, and salary-based GP remuneration models translated into lower levels of patient self-efficacy. This finding may stem from patient self-selection around specific organizational characteristics; clinics that have developed these characteristics are the ones that cater to heavier patient caseloads. For example, multidisciplinary practice and salary-based GP remuneration are mostly encountered in community practices; these practices typically cater to a more complex clientele that generally reports lower self-rated health, tends to be slightly older and presents with more co-morbidities. Inversely, unidisciplinary practice (GP only), weak linkage with health system information networks and exclusive fee-for-service GP remuneration were generally found in private group or solo practices, which tended to follow patients with better self-rated health and fewer co-morbid conditions. Family medicine groups, an emerging group practice model offering services to a registered clientele, are characterized by high reliance on expanded nurse roles. Possibly, these new nursing roles were still not well implemented when the organizational survey was conducted (2005), and therefore may not have yielded the expected results in terms of self-management support. Further, patient self-selection may have masked the true effect of the organizational attributes under study and may also reflect the varying capacity of PHC models for managing complex chronic cases. Finally, self-efficacy may not be influenced only by PHC affiliation but also plays a role in determining this affiliation: patients with poorer health status and poorer associated self-efficacy may cluster around PHC organizations exhibiting attributes that better address their needs.

Study limitations

Because this was an observational study, we could not control for all potential confounders. However, when attempting to create practical knowledge to guide healthcare improvement, this approach reflects real-life situations that may offer greater generalizability for policy makers than highly controlled trials (Perrin and Mitchell 1997).

Self-efficacy scales employed for this study were developed to measure change pre– and post–self-management training programs. Given the small expected variations in self-efficacy over time and the absence of a specific self-management intervention, they may have lacked the sensitivity required to capture natural self-efficacy variations over time. Another potential bias may exist because of losses to follow-up. Co-morbidity differences identified in participants who did not complete all three study phases may have modified group compositions: more vulnerable patients may be underrepresented, partly masking the effect of organizational factors on patients facing multi-morbidity or frailty issues. Finally, self-management support appears low in all PHC in Quebec; a majority of participants reported not being actively involved in care decisions (Lévesque et al. 2010), making it difficult to detect significant differences across organizations for patient outcomes relating to self-management.

Conclusion

Despite methodological challenges, the findings of this longitudinal study suggest that the strongest predictors of self-efficacy for managing chronic disease stem from health and life circumstances. Transient events, such as an acute illness or other adverse event, may considerably alter one's confidence in managing ill health, making it crucial that healthcare providers pay extra attention to patients' health and personal history when designing self-management interventions.

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Appendix A

PHC models – types (proportion of affiliated patients)	Definition and main characteristics
Solo provider (8%)	• Most often, one physician per organization, no on-site nurse or technical support centre. Occasionally, two or three physicians share the space but their practices remain separate and little integrated • A vision based on the principles of family medicine with a fairly limited service offer • Private professional governance and fee-for-service payment • Mostly focused on continuity of services and follow-up of regular clienteles • Little information technology to support clinical activities
Group practice (34%)	• Small- and medium-sized medical teams of varying sizes with little formalized professional group work and usually no interdisciplinarity • Organizational priorities that converge towards accessibility of services and responding to short-term medical needs, mostly walk-in visits • Private professional governance and fee-for-service payment
Family medicine groups (FMGs) (22%)	• Medium-sized medical teams of six to 10 physicians catering to a registered clientele • Organizational structure that fosters cohesion among professionals as well as greater systemic integration, formalized group work and developed interdisciplinarity (mostly with nurses) • A vision based on the principles of family medicine, with organizational priorities being continuity of services and follow-up of regular patients • Greater coverage time (evenings and weekends), broader range of services supplemented (ex: emergency lines) • Private professional governance and fee-for-service payment
Community practice (36%)	• Integrated into public healthcare network institutions • Teams of caregivers consisting of several physicians (more than six), nurses and other health professionals (dietitians, rehabilitation professionals, etc.) • Public governance and fee-for-service as well as time-based remuneration • A vision that focuses on accountability for the health of the population • Formalized professional group work and interdisciplinarity that has been developed • Broad range of services including public health activities

Appendix B

Inclusion diagnoses

The four inclusion diagnoses are chronic conditions, acknowledged as requiring close primary care monitoring and for which good self-management is necessary, including: heart failure, chronic obstructive pulmonary disease, arthritis and diabetes (17).

"Chronic" was defined as lasting for over three months and/or susceptible to lasting over three months.

Conditions that were considered for each inclusion diagnosis were:

- *Arthritis:* All inflammatory and chronic non-inflammatory arthritis except juvenile arthritis and infectious arthritis. This included rhumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, inflammatory polyarthropathies, arthrosis or chronic osteochronic.

- *Diabetes:* Both types of insulinodependent or non-insulinodependent diabetes (type 1 / type 2) with as well as without diabetes-related complications, but excluding juvenile diabetes.
- *Heart Failure:* Diagnoses of congestive, left or right heart failure, systolic or diastolic dysfunction, pulmonary oedema and cardiac asthma, with or without atherosclerosis.
- *Chronic Obstructive Pulmonary Disease (COPD):* This included chronic bronchitis, emphysema and chronic bronchial asthma.

Distribution of patients' characteristics across PHC models

	Proportion of primary healthcare patients (%)			
	Solo provider	**Group practice**	**Family medicine group**	**Community practice**
Characteristics linked to a higher burden of care				
Aged 75 years and older	28.3	32.7	15.2	34.9
6 co-morbidities or more	16.7	20.3	23.4	33.0
Home care user	9.6	6.6	13.0	23.2
Fair to bad perceived health	35.1	24.0	35.1	25.6
Characteristics having an impact on health				
Woman	51.5	50.8	52.7	62.1
Living alone	50.0	52.0	72.7	59.9
Non-Caucasian	0.0	7.9	0.0	9.4
Education 7 years or less (primary school)	30.5	25.8	24.4	14.7
Yearly income under $15,000 CAD	24.1	24.6	7.4	16.3

ONLINE EXCLUSIVE

A Global Approach to Evaluation of Health Services Utilization: Concepts and Measures

Approche globale d'évaluation de l'utilisation de services de santé : concepts et mesures

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Abstract

Health services utilization has been the object of many books and papers in the literature. Measures associated with utilization are often a function of volume of services. The objective of this paper is to present a comprehensive approach to the evaluation of health services utilization and of associated measures, using databases. Based on the theoretical framework of Starfield (1998), we analyze health services utilization with the help of indicators that are not directly linked to volume but that indirectly provide an estimate, while also documenting the qualitative aspects of utilization. The indicators mark accessibility, continuity, comprehensiveness and productivity of care. Once the concepts have been defined, we propose their operationalization using the databases. We then present the advantages of multidimensional conceptualization of health services utilization through a simultaneous analysis of these indicators. Researchers and decision-makers in public health and health planning have much to gain from this innovative multidimensional approach, which presents a dynamic conceptualization of health services utilization based on health administrative data.

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Résumé

Dans les nombreuses publications sur l'utilisation des services de santé, les mesures portent le plus souvent sur le volume de services. L'objectif de cet article est de présenter une approche globale d'évaluation de l'utilisation des services de santé de première ligne, et des mesures qui y sont associées à partir des banques de données. En nous basant sur le cadre théorique de Starfield (1998), nous proposons d'analyser l'utilisation des services à l'aide d'indicateurs qui ne sont pas directement liés au volume, mais qui indirectement en donnent une approximation, tout en documentant les aspects qualitatifs de l'utilisation. Ces indicateurs relèvent de l'accessibilité, la continuité, la globalité, et la productivité des soins. Après avoir défini chacun des concepts, nous en proposons leur opérationnalisation à partir des bases de données. Nous présentons ensuite l'intérêt de cette conceptualisation multidimensionnelle de l'utilisation des services à l'aide de l'analyse simultanée de ces indicateurs. Les chercheurs et décideurs en santé publique et en planification de la santé trouveront avantage dans l'utilisation de cette approche multidimensionnelle novatrice. Elle offre une conceptualisation de l'utilisation des services de santé dynamique en s'appuyant sur des bases de données médico-administratives.

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* * *

HEALTH SERVICES UTILIZATION HAS BEEN THE SUBJECT OF MANY BOOKS AND papers published in recent years. Utilization is defined as the outcome of the interaction between health professionals and patients (Donabedian 1973). In economic terms, it corresponds to the production of health services and, more specifically in this paper, to the production of health services by physicians (Folland et al. 2006). It is customary to use medical administrative data banks to analyze health services utilization. Measures traditionally associated with health services utilization have often been expressed by outcomes and volume of services. Yet, utilization is a multidimensional process (Donabedian 1973; Starfield 1998).

The objective of this paper is to present a comprehensive, multidimensional and dynamic approach to evaluating health services utilization and its associated measures, using medical administrative databases. Services utilization is considered from the viewpoint of provision of services by physicians.

First, we present various approaches employed to evaluate health services utilization beyond mere volume indicators. Using Starfield's (1998) theoretical framework, we propose a multidimensional evaluation framework for health services utilization. We then highlight various ways of operationalizing indicators. Finally, we illustrate the usefulness of such an approach through an example.

Approaches Used in National and International Institutions

Over the past few years, a number of international organizations have undertaken analyses of health services utilization and health systems, using multidimensional conceptualizations that go beyond mere outcomes. In a 2008 report, the World Health Organization described characteristics of primary care based on several features: "person-centredness, comprehensiveness and integration, and continuity of care, with a regular point of entry into the health system, so that it becomes possible to build an enduring relationship of trust between people and their health-care providers" (Van Lerberghe et al. 2008). These components recognize multidimensional aspects of primary care.

The Organisation for Economic Co-operation and Development (OECD) has developed indicators for years and published reports on the performance of health systems. Countries are classified using weighted sums of scores obtained for each indicator.

Funded by Canada's federal government, the Conference Board of Canada is an organization that offers consulting services. It has also analyzed the performance of health systems, based on several indicators. In its latest health report, the Conference Board uses OECD data to compare the performance of 17 health systems in industrialized countries, using 11 health-related indicators.

The Commonwealth Fund also compares member countries based on indicators for quality of care, accessibility, efficiency, equity and healthcare expenses (Davis et al. 2004; Shea et al. 2007). A report by the Canadian Institute for Health Information (CIHI/ICIS) also puts forward a health indicator framework that includes four dimensions (ICIS 2009). In this report, the indicators are presented independently of one another, with no concern for a comprehensive or multidimensional view.

All these organizations employ several indicators to analyze or compare health systems and health services utilization. This approach opens the door to analyses based on multidimensional conceptualization. However, although these studies take into account numerous indicators in their analyses of health systems, they simply add up scores on each indicator for a given country. Aggregating indicators reduces the available information to a single overall score. The studies rank countries based on their final score, without taking into account the interdependence and possible relationships among indicators. Moreover, when an overall score is used to analyze the performance of health systems and to rank countries, it is impossible to see the indicators for which countries obtain the best and worst scores. Insofar as we agree with the fact that one indicator cannot be substituted for another (e.g., continuity and accessibility), we must move beyond these methods that consist of performing weighted sums of indicator outcomes. It would be more enlightening to think in terms of indicator profiles and relationships among indicators than in terms of aggregation of indicators.

To analyze the performance of Quebec's health system, Sicotte and colleagues (1998) put forward a theoretical framework based on the work of Parsons (1951). The authors reviewed the state of knowledge about performance and integrated it into a multidimensional theoretical framework that can be broken down into four dimensions: adaptation, goal attainment, integration and latency (Sicotte et al. 1998). A performance evaluation report of Quebec's health and social services system, written by the Health and Welfare Commissioner (Levesque 2009), drew inspiration from Sicotte's theoretical framework. It used four dimensions to assess the health system's performance: adaptation, production, development and maintenance of organizational culture, and attainment of goals. A number of indicators were developed for each dimension. The authors then performed a systematic and comprehensive analysis of the indicators within each dimension. They conducted an evaluation of primary care, based on a comprehensive and integrated performance assessment, which was itself based on a configurational vision (Levesque 2009).

Among the studies cited above, we find a will to perform multidimensional evaluations that go beyond mere results-based approaches. However, whatever the level of analysis (macro or micro), most studies analyze services utilization or the health system using synthetic or aggregate indicators. Only Quebec's Health and Welfare Commissioner, who employed a configurational perspective, puts forward a dynamic, multidimensional and integrated approach to evaluation of health services analysis (Levesque 2009).

How to Conduct a Multidimensional Assessment of Primary Care Services Utilization

Services utilization can be assessed from two perspectives: the patient's or the physician's. The first – the patient's perspective – is somewhat subjective because it is based on patient-reported services. A study by Haggerty and colleagues (2008) is a good example of an analysis of health services utilization from the patient's point of view. The second perspective is more objective, because it hinges on volume of medical services offered by physicians to patients and recorded in databases. It is this perspective that we explore in this paper.

Measure of services utilization, from the physician's perspective, is often based on economic indicators based on volume, such as number of hospitalizations per year, number of medical acts, number of patients and number of visits (Andersen and Newman 1973; Beland 1988). An evaluation of services utilization initially involves a volume analysis. In the literature, numerous studies perform services utilization analyses with multivariate analyses based on volume indicators such as medical visits. However, the results of many of these studies are disappointing because of the low percentage of variance explained (Beland 1982). According to Mechanic (1979), the difficulties such studies encounter depend on how the issues are conceptualized, the type of indicators used, the way data are aggregated and the analytical methods chosen. Therefore, we propose to analyze health services utilization with indicators not directly linked to volume through indirectly estimating it, which also document the qualitative aspects of utilization.

A Four-Dimensional Approach

According to Starfield (1998), four essential elements are required for achieving quality of primary care: first contact, longitudinality, comprehensiveness and coordination (integration). First contact implies accessibility: each person who wishes to use health services should have access. Longitudinality refers to continuity, to management of care over time. Comprehensiveness means that a range of services should be available. In the following paragraphs, we describe three of Starfield's indicators of quality: continuity, comprehensiveness and accessibility. Because we are exploring utilization from the angle of service delivery by physicians, we will add productivity to these three indicators, for its relevance to volume and quality. Productivity imparts a non-static image of volume because it makes a connection between production and resources. After defining the four concepts, we suggest possible operationalizations for each of them, using linking data from Régie d'assurance maladie du Québec and from Collège des médecins du Québec. This linked database includes information concerning hours worked, income, acts, patients, and number of visits and days worked billed, for all general practitioners.

Continuity

Continuity refers to the extent to which healthcare is provided uninterrupted over time, within a single care episode or several (Starfield 1998; Lamarche et al. 2003; Levesque et al. 2003). Continuity thus corresponds to ongoing provision of care and integrates a notion of longitudinality. The concept of continuity has not yet been clearly defined (Saultz 2003). In their knowledge synthesis, Haggerty and colleagues (2003) attempt to define three types of continuity: informational, management and relational. Informational continuity refers to the availability and use of past events and circumstances (e.g., prior visits, laboratory results, consultations, referrals) to ensure appropriate current care for the patient. Management continuity guarantees that the care given by several providers is coherent. Management continuity is especially important for chronic health problems. Relational continuity acknowledges the importance of knowing the patient as a person. It refers to an ongoing therapeutic relationship between a patient and one or more care providers.

Comprehensiveness

Comprehensiveness is a two-dimensional concept: it refers to the person as a whole and to all the care that person might need. In other words, it implies a comprehensive approach to individuals in which the full range of their health needs are recognized. There are several levels of health needs: biological, psychological and social. The second aspect of comprehensiveness, and this is the one of interest to us, refers to the range of services offered by a physician or a healthcare organization. Services include preventive, treatment and even palliative care.

Identifying needs and offering an array of services to meet these needs are two key elements of comprehensiveness (Starfield 1998; Levesque et al. 2003). Comprehensiveness can be seen as an attribute to both utilization and service delivery.

Chan (2002) has assessed the declining comprehensiveness of primary care by looking at whether physicians perform a minimum threshold number of services from among the following: emergencies, nursing homes, hospitals (50 visits a year), house calls (10 visits a year) and at least two deliveries a year. In this study, Chan measures comprehensiveness by range of services offered. Starfield's (1998) approach is similar in that she indicates that comprehensiveness of health services is measured through range of services. Comprehensiveness can thus be easily determined using data banks. It is a matter of choosing a range of acts billed by physicians that represent the comprehensiveness of services offered.

Accessibility

The notion of accessibility is an attribute of an institution or service that can be accessed (Donabedian 1973; Frenk 1992). It refers to characteristics that facilitate or hinder efforts to reach care services (Pineault and Daveluy 1995). Donabedian (1973) describes access as a group of factors that intervene between capacity to provide services and actual provision or consumption of services. Accessibility is a characteristic of the resources themselves that renders these resources more or less easy to use. According to Levesque and colleagues (2003), several dimensions of access can be measured. Geographical accessibility (geographical availability) is based on (physical and temporal) distance between the location of users and the provision of services. Organizational accessibility (organizational availability) is based on schedules and procedures to follow that constitute constraints for individuals. Social accessibility involves compatibility between services offered and the social and cultural characteristics of individuals. Finally, economic accessibility is linked to the costs of services in relation to individuals' socio-economic status (Starfield 1998).

It is difficult to measure the full concept of accessibility using data banks. However, some aspects of accessibility can be assessed through medical services billed by physicians. Let us look at organizational accessibility, for example. The literature shows that it is possible to use such measures as walk-in visits and availability of after-hours care (Forrest and Starfield 1998) and house calls (Safran et al. 2000).

Productivity

Productivity is defined as the relationship between the production of goods or services and the quantity of factors of production. The notion of productivity refers to a system's capacity to generate a volume of services based on resources available. According to Donabedian (1973), productivity is an intervening factor between resources and production that leads to the conversion of a quantity of resources into a volume of activity. In short, to analyze productivity it is necessary to look at the way resources are employed to produce services (Contandriopoulos et al. 1993). In economic terms, these definitions of productivity express a function of production that links resources to services. The derivative of this function of production provides indications of marginal productivity. In the area of health, work makes up a large part of production factors. As a result, productivity can be measured by the work input-to-output ratio. An increase in worker productivity in the health system increases the output level (Folland et al. 2006).

Concept Operationalization

Continuity

No single operational measure can fully capture the concept of continuity as a whole (Reid et al. 2002). Most indicators of measures of continuity, constructed from medical administrative databases, use chronology of care over time between a patient and a health professional. Concentration over time of services provided by a professional to a patient is evaluated to determine continuity of care. It is possible, for example, to use the number of visits to a physician per patient over a given period of time. The higher the number of visits per patient, the more continuity of care a physician provides to his or her patients. This type of measurement can assess relational continuity because it measures the strength of the patient–doctor interpersonal relationship. Indeed, we assume that prolonged or repeated contact with the same professional builds a stronger relationship, better utilization and information transfer, and more coherent care management (Breslau et al. 2008). Concentrated patient visits to a physician is a good indicator of patient affiliation with a physician and, therefore, relational continuity. A forthcoming study by Burge and Haggerty (2011) indicates that with the concept of relational continuity we can appreciate a physician's knowledge of a patient as well as the concentration of care. In addition, various forms of continuity, as measured in a study by Pineault and colleagues (2008), are correlated. Recent studies thus show that there is a relationship among the three aspects of continuity. By measuring only one of these aspects, it is possible to learn something about continuity as a whole.

Comprehensiveness

In Quebec, general practitioners can bill for the following acts: regular examinations, complete examinations and detailed complete examinations. A regular examination includes at least one of the following: a questionnaire and examination needed for diagnosis and treatment of a minor ailment, initiation of treatment, assessment of a course of treatment and observation of illness evolution. A complete examination involves two elements: a patient questionnaire and a clinical examination of one or several organs or systems related to the reason for the consultation. A detailed complete examination includes a complete patient questionnaire, a clinical examination, recommendations for the patient and recording significant data identified by the physician in the file (Régie de l'assurance maladie du Québec 2010). Only one detailed complete examination can be billed per patient each year. We have analyzed the distributions of these three types of acts for all physicians for a year.

Regular examinations were grouped into three types:

- A practice composed of fewer than 35% of regular examinations
- A practice composed of 35% to 45% of regular examinations
- A practice composed more than 45% of regular examinations

Complete examinations were grouped into three types:

- A practice composed of fewer than 45% of complete examinations
- A practice composed of 45% to 60% of complete examinations
- A practice composed of more than 60% of complete examinations

Detailed complete examinations were grouped into three types:

- A practice composed of fewer than 5% of detailed complete examinations
- A practice composed of 5% to 15% of detailed complete examinations
- A practice composed of more than 15% of detailed complete examinations

Based on these three variables, we constructed an indicator for comprehensiveness of care. Practices composed of more than 15% of detailed complete examinations were defined as highly comprehensive. Likewise, practices composed of average types in all three categories of acts were qualified as highly comprehensive. Practices with fewer than 5% of detailed complete examinations and at least one type that is weak for one of the other two acts were qualified as low in comprehensiveness. These three types of acts shed some light on the scope of services offered by general practitioners. When we combine them, we obtain an estimate of comprehensiveness of services provided by physicians (Borgès Da Silva 2010).

Accessibility

The organizational aspect of accessibility can be analyzed. The literature shows that it is possible to use such measures as density of walk-in visits and availability of after-hours care. In Quebec, physicians can bill for certain acts or types of service packages for services provided on-call and outside office hours. When we combine them, we obtain an estimate of organizational accessibility.

Productivity

To measure productivity of service delivery, we analyze the work output factor and, more specifically, the physician's work. Input is measured in terms of work time, usually referred to as hours worked.

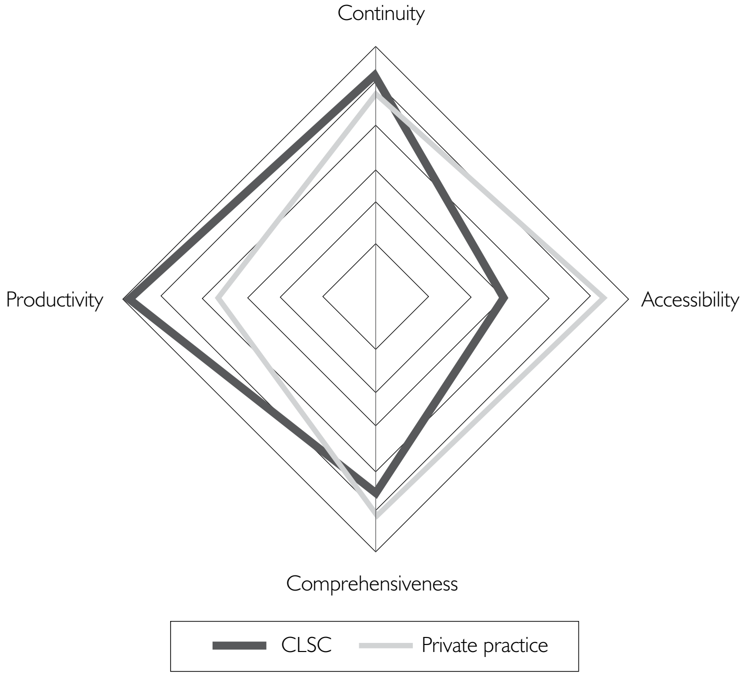
The definition of output is more complex. As Reinhardt (1972) noted, we can use number of patient visits, number of visits in private clinics or patient billing. We can also use variables such as number of acts, number of patients or income (Donabedian 1973).

Therefore, the productivity measure consists in calculating an indicator that provides information on the relationship between number of hours worked by physicians in this context and an output chosen among those listed in the previous paragraph. The output we propose to use is physicians' total clinical income. The input we propose to use is number of hours per year dedicated to clinical activities. Productivity is thus measured using income per hour.

Multidimensional Conceptualization Needed

Based on Starfield's (1998) theoretical framework, we have presented concepts associated with analysis of health services utilization and measures using data banks. The fact of using indicators that go beyond volume and that enable us to view services utilization as a multidimensional, dynamic and integrated process provides a global picture of services utilization that considers the essential components identified by Starfield (1998). Adding productivity, an indicator of volume relating input and output of health services utilization, enriches evaluation of services utilization, seen from an angle of service delivery, using databases. This approach helps us move beyond static analysis of services utilization by volume, and take into account the multidimensional aspects inherent to services utilization. Indeed, indicators interact continually and evolve simultaneously by mutually influencing one another. Thus, they are interdependent and dynamic.

FIGURE 1. Configuration of indicators related to physicians working only in private practices and those working only in local community centres (CLSCs)



In the literature, very few studies have examined the relationship between these indicators, pair by pair. The indicators are often considered from the patient's point of view. For example, Haggerty and colleagues (2008) used surveys to analyze the characteristics of physicians' practices associated with patient-reported accessibility, continuity and coordinated care. What emerges is that it is difficult to attain a balance between continuity and accessibility. Physicians often organize their practices around continuity at the expense of accessibility. Yet, a minimum of accessibility is required to be able to provide continuity.

A recent study based on this type of multidimensional and dynamic approach shows results on service utilization seen from the standpoint of provision of services by physicians. It appears that physicians in private clinics provide high continuity and productivity at the expense of accessibility. Physicians working in local community centres (CLSCs) show higher levels of comprehensiveness and accessibility than the average for physicians in Quebec, but productivity and continuity are weaker (Borgès Da Silva 2010) (see Figure 1). This multidimensional approach to services utilization allows, for example, highlighting differences in services delivery by physicians, based on practice setting.

Conclusion

We have presented a comprehensive, dynamic and integrated approach to health services utilization from the perspective of health services delivery. It is based on process indicators (accessibility, continuity and comprehensiveness) and outcome indicators (productivity) that evolve simultaneously while influencing one another. Our indicators were constructed from medical administrative databases, an approach that increases the generalizability of our study. This approach could be generalized at a meso or macro level to obtain a dynamic multidimensional analysis of the health system.

Public health and health planning researchers and decision-makers will benefit from this type of innovative multidimensional approach. It sets out a dynamic conceptualization of health services utilization while relying on medical administrative databases.

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