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Research Output of the Canadian Pharmaceutical Industry: Where Has All the R&D Gone?

NORMAN KALANT AND IAN SHRIER

Missed Opportunity: Patients Who Leave Emergency Departments without Being Seen

AKERKE BAIBERGENOVA, KIRA LEEB, ALEKSANDRA JOKOVIC AND SHARON GUSHUE

The Manitoba First Nations Centre for Aboriginal Health Research: Knowledge Translation with Indigenous Communities

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High Reliability versus High Autonomy: Dryden, Murphy and Patient Safety

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Data Matters • *Discussion and Debate*
Linkage and Exchange

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Telephone: 416-864-9667 Fax: 416-368-4443

ADDRESSES

All mail should go to: Longwoods Publishing Corporation, 260 Adelaide Street East, No. 8, Toronto, Ontario M5A 1N1, Canada

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EDITORIAL

The Journal's First Year

One hundred and twelve manuscripts, 2,000 emails and four issues later, *Healthcare Policy/Politiques de Santé* has completed one year of publication. The number, quality and variety of submitted manuscripts has vastly exceeded our expectations, dispelling whatever doubts we had about the need for a Canadian journal dedicated to health services, management and policy research.

Regular readers will note that during the first year, new columns and sections were introduced to reflect the eclectic nature of knowledge and knowledge transfer. While formal research papers are essential, case studies, commentaries, interviews and quick-hit data analyses can also inform decision-making.

The journal is available online through a growing number of institutional subscribers and to members of the Canadian Association of Health Services and Policy Research (CAHSPR) as a benefit of membership. Downloads of individual papers can be purchased through the Longwoods Publishing website. The number of "hits" has already exceeded 2,000 for several papers.

The ultimate acceptance rate for submitted manuscripts is impossible to know, because 52 of the 112 manuscripts received to date are still at varying stages of peer review. Of the remainder, 20 have been published or accepted for publication and 40 have been rejected.

During its first year, the journal has been well served by an editorial team of academics and decision-makers consisting of Bob Evans, chair of the Editorial Advisory Board and regular columnist; senior editors François Béland and Rick Roger; and editors Colleen Flood, John Horne, Pascale Lehoux and Luc Boileau. As editor-in-chief, I am much indebted to them for their enthusiasm, hard work, forbearance and good humour.

Under Bob Evans's leadership we have assembled an impressive contingent of accomplished researchers and decision-makers to serve on our editorial advisory board.

I have been further blessed to work with the capable and committed team at Longwoods Publishing, especially publisher (and occasional contributor) Anton Hart, executive editor Dianne Foster-Kent, managing editor Rebecca Hart, copy editor Francine Geraci, designers Yvonne Koo and Jonathan Whitehead, translator Josephine Versace and proofreaders Rodney Rawlings and Wayne Herrington. I am particularly grateful for their tolerance of my challenging combination of fussiness and a loose grasp of the concept of deadlines.

Reviewers are the heart and soul of peer-reviewed journals. In our first year, 176 academics and decision-makers served as peer reviewers for *Healthcare Policy/Politiques de Santé*. As with the editorial team, the combination of perspectives has worked remarkably well. Interestingly, as often as not, decision-makers offer helpful comments on research issues, and academics contribute valuable observations on policy implications.

The future success of the journal will depend on an expanding company of authors, reviewers, editors and readers – we hope, including you.

BRIAN HUTCHISON, MD, MSC, FCFP
Editor-in-chief

La première année de la Revue

Healthcare Policy/Politiques de Santé VIENT DE FÊTER SON PREMIER anniversaire, et ce après cent douze manuscrits, deux mille courriels et quatre numéros publiés. Le nombre, la qualité et la variété des manuscrits ont dépassé de loin nos attentes, et ont dissipé tous les doutes que nous avions quant à savoir si un journal canadien consacré aux services de santé, à la gestion et à la recherche en matière de politique dans le domaine serait utile.

Les lecteurs réguliers auront certainement remarqué qu'au cours de cette première année, de nouvelles chroniques et sections ont été ajoutées pour refléter la nature éclectique des connaissances et du transfert des connaissances. Si les travaux de recherche en bonne et due forme sont essentiels, les études de cas, les commentaires, les entrevues et les analyses de données ponctuelles peuvent aussi être utiles à la prise de décisions.

La Revue est disponible en ligne par l'intermédiaire d'un nombre croissant d'institutions qui y sont abonnées, et les membres de l'Association canadienne pour la recherche sur les services et les politiques de la santé (ACRSPS) y ont aussi accès. Il est possible de télécharger les articles (moyennant des frais) à partir du site web de Longwoods Publishing. Plusieurs articles ont déjà eu plus de 2 000 visites.

Il est impossible de connaître le taux définitif d'acceptation des manuscrits pour le moment étant donné que sur 112 manuscrits soumis, 52 sont encore à différentes étapes du processus d'examen. Sur les 60 restants, 20 ont été publiés ou acceptés en vue d'être publiés et 40 ont été rejetés.

Au cours de cette première année, le comité de rédaction composé d'universitaires et de décideurs a apporté sa précieuse contribution à la Revue : Bob Evans, président : Conseil consultatif de rédaction et chroniqueur régulier; François Béland et Rick Roger : rédacteurs principaux; Colleen Flood, John Horne, Pascale Lehoux et Luc Boileau : rédacteurs. À titre de rédacteur en chef, je leur dois énormément et leur suis très reconnaissant de leur enthousiasme, leur travail acharné, leur indulgence et leur bonne humeur.

Sous la direction de Bob Evans, nous avons établi un Conseil consultatif de rédaction impressionnant grâce à la réunion de chercheurs et de décideurs accomplis.

J'ai par ailleurs eu la chance de travailler avec une équipe de personnes compétentes et dévouées de chez Longwoods Publishing, et spécialement avec Anton Hart, éditeur, et rédacteur à l'occasion, Dianne Foster-Kent, directrice de la rédaction, Rebecca Hart, rédactrice en chef, Francine Geraci, réviseure, Yvonne Koo et Jonathan Whitehead, concepteurs, Josephine Versace, traductrice et enfin Rodney Rawlings et Wayne Herrington, correcteurs d'épreuves. Je leur suis tout particulièrement reconnaissant de la tolérance dont ils font preuve devant, à la fois, mes exigences et mon concept vague des échéances, deux caractéristiques qui peuvent être difficiles à gérer en même temps.

Les examinateurs sont au cœur même des revues fondées sur l'examen par les pairs. Au cours de notre première année, 176 universitaires et décideurs ont joué le rôle d'examinateurs pour *Healthcare Policy/Politiques de Santé*. Comme cela a été le cas pour le comité de rédaction, la combinaison de ces deux perspectives a fonctionné de façon remarquable. Par ailleurs, il est intéressant de remarquer que, régulièrement, les décideurs font des commentaires utiles sur des questions de recherche et vice-versa, les universitaires ont des remarques intéressantes quant aux implications pour les politiques.

Le succès dans le temps de la Revue dépendra de l'évolution de la participation des auteurs, des examinateurs, des réviseurs et bien sûr du nombre de lecteurs, et nous espérons bien pouvoir vous compter parmi ceux-ci.

BRIAN HUTCHISON, MD, MSC, FCFP
Rédacteur en chef


Breakfast with the Chiefs

High Reliability versus High Autonomy: Dryden, Murphy and Patient Safety

Haut niveau de fiabilité ou un haut niveau d'autonomie? Dryden, Murphy et la sécurité des patients

by ROBERT G. EVANS, KAREN CARDIFF AND SAM SHEPS

Abstract

Healthcare is not a high-reliability industry. The adverse event rate is on the order of 10^{-2}; industries such as aviation, nuclear power and railways achieve rates of 10^{-5} or better. Increasing awareness of this contrast has made "patient safety" a major topic of concern. High reliability in other industries flows from a combination of "engineered safety," tight regulation ("high-level constraints") and the development of a "culture of safety" that recognizes error as a systemic rather than a personal failure. In medicine, achieving such a combination would involve abandoning deeply embedded and centuries-old traditions of individualism, clinical autonomy and personal responsibility. This will not happen. Watch instead for safety concerns to be diverted into activities that do not threaten core values.

Résumé

Les soins de santé ne sont pas une industrie qui peut se vanter d'avoir une cote de fiabilité très élevée. Le taux d'occurrence des événements indésirables est de l'ordre de 10^{-2}, comparativement à un taux de 10^{-5} ou moins dans les industries comme l'aviation, l'énergie nucléaire et les chemins de fer. Une prise de conscience accrue de ce contraste a fait de la sécurité du patient un sujet qui est source de nombreuses préoccupations. Le haut niveau de fiabilité observé dans les autres industries est attribuable à une « sûreté technologique », à des règlements rigoureux (« contraintes élevées ») et à la mise en place d'une « culture de la sécurité » en vertu de laquelle l'erreur constitue une faille systémique plutôt que personnelle. En médecine, la mise en place d'une telle combinaison nécessiterait l'abandon des traditions séculaires profondément ancrées d'individualisme, d'autonomie clinique et de responsabilité personnelle. Cela ne se produira pas. Nous croyons plutôt que les questions de sécurité seront détournées vers des activités qui ne menacent pas les valeurs de base.

The First Story: Flight AO 1363

At 12:09 CST on March 10, 1989, Air Ontario #1363 took off from Dryden Municipal Airport. Just over a minute later the aircraft ceased to fly, crashing in a wooded area beyond the end of the runway and catching fire. Twenty-four people, passengers and crew, were killed. The proximate cause of the disaster was clear enough; the aircraft's wings were heavily "contaminated" with black ice and wet snow, and could not provide adequate lift. It failed to gain altitude, and hit the trees.

The accident might have been labelled a simple case of pilot error. Captain George Morwood's fatal command decision was certainly an error. He should not have attempted to take off under conditions so fraught with risk. But he did, and he was neither inexperienced nor incompetent. Nor, as Mr. Justice Moshansky dryly remarked, was there any evidence that he was suicidal. There had to be more to the story.

The Second Story

There was, much more. The Hon. Virgil Moshansky, a Justice of the Queen's Bench of Alberta – and also a pilot – was appointed to head a Commission of Inquiry "to examine the entire Canadian aviation system for organizational failures, both latent and active, which might have contributed to the Captain's faulty decision" (Moshansky 2005). His final report (Moshansky 1992) is a landmark document in Canadian aviation. All 191 of its recommendations were accepted.

Many other factors lurk behind "pilot error"; failure in complex dynamic systems is typically multi-causal. Morwood had been sent into a trap by an inexperienced and unqualified flight dispatcher. He had landed at Dryden to refuel a heavily loaded flight returning from Thunder Bay to Winnipeg. He kept his engines running; if stopped, they could not be restarted. The flight and all its passengers would be stranded, at great company expense, until other aircraft could arrive.

The on-board Auxiliary Power Unit, which could have restarted the engines, had been out of service for five days. Company policy and profits required keeping aircraft in the air; inessential repairs could wait.

Air Ontario had, as an economy measure, cancelled plans to provide ground start facilities at Dryden. The on-board Auxiliary Power Unit, which could have restarted the engines, had been out of service for five days. Company policy and profits required keeping aircraft in the air; inessential repairs could wait. The weather in Dryden was foul, cold with freezing wet snow. But company policy – a policy that Moshansky described as "useless" – forbade de-icing while the engines were running. The pilot faced an ugly choice: abort the flight, or take your chances. In retrospect, he made the wrong choice. At the time, it must have seemed the better option.

The Silence of the Passengers

Captain Morwood was not available to give evidence. But a plausible interpretation would be that he expected the wings to be blown clean during take-off. The reasons they were not are somewhat technical. But the fact was observable and observed from the passenger compartment, and this raises one of the most dramatic aspects of the crash.

As the doomed aircraft began its final run towards take-off, the flight attendants and several passengers felt distinctly uncomfortable about their situation. In addition to the two flight attendants, there were among the passengers two commercial pilots *with their families*. No one made any attempt to bring their concerns to the cockpit.

There was also on board an RCMP special constable, who did mention his strong concerns to the senior flight attendant. She told him, incorrectly, that the aircraft had automatic de-icers; when he challenged this statement, she shrugged. The junior flight attendant testified that when she had, on previous flights, brought forward concerns, she had simply been told not to worry, and her concerns were ignored. But what if the two pilot passengers had spoken up? In any case, it didn't happen.

Complex systems always operate with multiple goals that are inherently contradictory and require trade-offs. Justice Moshansky's report, however, provides an appalling catalogue of deliberate management decisions to cut corners on safety. There is an air of Greek tragedy about the interaction of the de-regulatory *zeitgeist* with the desperate scramble for corporate profitability, moving inexorably towards the destruction of Air Ontario flight 1363.

The Endangered Species: Patients, not Passengers

Before resolving to travel in future by bus, however, one should recall that air travel was and is one of the safest activities in our society. It is a "minus-six" industry, with an adverse event rate on the order of 10^{-6}, that is, measured out of a million cases. This does not excuse either the managerial cost-cutting or the palsied regulatory environment that sent 24 people to their deaths. But it stands in some contrast to the healthcare sector, where the adverse event rate is on the order of 10^{-2}. For the numerically challenged, the healthcare rate is 10,000 times larger.

The contrast has been noticed. Practices in "high-reliability" industries may provide models, or at least lessons, for improvement of patient safety in what is clearly a "low-reliability" sector. Indeed, Moshansky (2005) was invited to reprise his summary of the events surrounding the Dryden crash, and his report more generally, at a Canadian Health Care Safety Symposium last year in Calgary.

From the other side of the fence, a writer in the *Aviation Safety Letter* ("Scrutinizing Aviation Culture" 2006) introduces readers to the term "professional courtesy," borrowed from medicine and law, as an explanation for the "silence of the lambs" in the passenger cabin of flight 1363 – the silence that perhaps cost them their last chance.

"Hierarchical deference" might be a better term, avoiding the economic overtones of "professional courtesy," but the point is the same. In a strongly hierarchical workplace, offering advice – particularly warnings – to a superior necessarily implies that the superior has failed either to notice or adequately to consider some potentially critical facts. On flight 1363, according to testimony, there were really two crews, not one, and the flight deck crew were not perceived as welcoming advice from the girls who poured the coffee.

This hierarchical division is a deeply embedded cultural reality in healthcare as well, and forms part of the backdrop to current calls for the creation of an alternative culture of safety. "Safety improvement efforts in health care often run up against traditional aspects of medicine's culture: steep hierarchies, tenuous teamwork, reluctance to acknowledge human fallibility, and a punitive approach to errors" (McCarthy and Blumenthal 2006). By contrast, "work environments committed to improving safety … are informed, just, and flexible; inspire individuals to report errors and near misses; and use safety data to learn and reform" (McCarthy and Blumenthal 2006).

People and Systems: Culture of Safety, Culture of Blame

These alternative cultures conceive of error in two quite different ways – the person approach and the system approach:

> The person approach focuses on the unsafe acts – errors and procedural violations – of people … as arising primarily from aberrant mental processes such as forgetfulness, inattention, poor motivation, carelessness, negligence, and recklessness. … [C]ountermeasures … include poster campaigns … , writing another procedure … , disciplinary measures, threat of litigation, retraining, naming, blaming, and shaming. Followers of this approach tend to treat errors as moral issues. (Reason 2000)

The system approach, by contrast, accepts that "to err is human":

> Errors are seen as consequences rather than causes, having their origins not so much in the perversity of human nature as in "upstream" systemic factors … . [T]hough we cannot change the human condition, we can change the conditions under which humans work. When an adverse event occurs, the important issue is not who blundered, but how and why the defences failed. (Reason 2000)

This is an important part of the second story.

Where Have We Heard This Before?

Students of the determinants of health and illness may at this point recognize a striking parallel with approaches to health promotion and disease prevention. There is a school of thought that views social differences in health as largely a consequence of individual bad behaviour arising from moral failings, a view epitomized by Satel (1997: 12–14) – "inferior nutrition, obesity, smoking, alcohol and drug abuse, and reckless sexual behaviour." Human error. Modern research and understanding, however, emphasize instead that the social environments in which people live and work create the conditions from which such behaviours emerge.

In short, there was no evidence that Captain Morwood was suicidal. The Dryden tragedy provides a textbook illustration of Reason's distinction. Captain Morwood's decision was the consequence not of his own perversity or "aberrant mental processes" but of " 'upstream' systemic factors" over which he had no control. He was trapped. A verdict of "pilot error" would have drawn a convenient veil over all those systemic failures – until the next tragedy.

Good Efforts, But …

McCarthy and Blumenthal (2006) offer a collection of case studies of efforts to create a "culture of safety" in particular organizations. These seem to have been relatively successful, with measurable outcomes in terms of reduced adverse events. "Flattening hierarchies" and improving communications are recurrent themes in these examples. But can they be generalized, and will they last? The traditional aspects of medicine's culture that they point to seem far too deeply rooted – not only in history, but in the power relationships and the associated economic structure of North American medicine – to be permanently shifted by well-meaning and enthusiastic, but superficial, efforts to encourage greater teamwork and better communication. Captain Murphy, I think, would have recommended a different approach.

This experience and others similar to it gave us Murphy's Law: "If there are two or more ways of doing something, and one of them will lead to catastrophe, then someone will do it."

The Real Murphy's Law: Engineering Is Better Than Education

Captain Edward A. Murphy was in charge of collecting physiological data from a series of experiments begun by the US Air Force in 1946 to study the effects on the human body of extreme flying conditions. Directed by Captain (later Lieutenant Colonel) John Stapp, MD, these came to focus on the G-forces generated by rapid deceleration (read: crash). Stapp himself was strapped onto a "rocket sled" (called, alas, the "Gee Whiz") that was propelled rapidly down a track into a set of hydraulic brakes. Electrodes attached to various parts of his body recorded the results.

The sled runs did not always yield as much data as expected. On one particular occasion, no data at all were recorded. It turned out that the technicians had wired every single electrode incorrectly. This experience and others similar to it gave us Murphy's Law: "If there are two or more ways of doing something, and one of them will lead to catastrophe, then someone will do it" (Matthews 1997).

The subsequent simplification to "If a thing can go wrong, it will" actually loses Murphy's point. He was not making a sad existential statement about the inherent cussedness of the universe, or a sardonic joke. Rather, he was stating a fundamental principle in safety engineering. The corollary to his law is: Engineer the situation so that there is only one way of doing a thing – the right way. Do not rely on the human element to make the correct choice. Humans may choose poorly.

Passing Gas Safely: Technology, Regulation and Culture

But can you do this in such a personalized field as medicine? Well, yes, and American anaesthesiologists have led the way (Gaba 2000). From a combination of inspired professional leadership and fear of malpractice litigation, they have for a number of years taken patient safety very seriously, indeed. One strategy they have adopted follows Murphy: the development of "engineered safety devices." Require gas hose connectors, for example, to be designed so that it is physically impossible to attach the hose to the wrong place. Require manufacturers to design equipment so that the knobs and the on/off switches work the same way on every machine. In general, standardize the work environment to minimize and, where possible, eliminate "recurrent error traps."

From a combination of inspired professional leadership and fear of malpractice litigation, they (American anaesthesiologists) have for a number of years taken patient safety very seriously, indeed.

Technological strategies, however, constitute only one component of the anaesthesiologists' overall approach to patient safety. Formulation and adoption of standards and guidelines for practice have also been important, as has the conscious adoption of a system perspective and "human factors engineering" – systematic and critical review of their own tasks and behaviour (Gaba 2000). There really does appear to have been a cultural shift, in this field at least.

The author of the *Aviation Safety Letter* ("Scrutinizing Aviation Culture" 2006) describes a similar cultural shift: "I'll be the first to admit that it takes a lot of nerve for an off-duty pilot to step out of the passenger mentality and speak out … . Fortunately, … [c]rew members now understand such advice as totally acceptable and expected." (But only from other pilots?)

Reason versus Tradition in Medicine: The Satisfactions of Scapegoating

The prospects for a general shift towards a "culture of safety" in medicine, however, may be a good deal less bright. To quote Reason (2000) again:

> The person approach remains the dominant tradition in medicine, as elsewhere. From some perspectives it has much to commend it. Blaming individuals is emotionally more satisfying than targeting institutions. People are viewed as free agents capable of choosing between safe and unsafe modes of behaviour. If something goes wrong, it seems obvious that an individual (or group of individuals) must have been responsible. Seeking as far as possible to uncouple a person's unsafe acts from any institutional responsibility is clearly in the interests of managers. It is also legally more convenient, at least in Britain.

(All very familiar to students of the determinants of health.)

> Nevertheless, the person approach has serious shortcomings and is ill suited to the medical domain. Indeed, continued adherence to this approach is likely to thwart the development of safer healthcare institutions. (Reason 2000)

Is High Reliability Worth the Cost? To Whom?

Sheps and Cardiff (2005) characterize healthcare as a "high-reliability–seeking" industry that is clearly not, at present, high reliability. But how serious are the leaders of that industry about seeking high reliability? Would physicians, in particular, be willing to pay the price, in terms of major organizational change? "Becoming ultrasafe may require healthcare to abandon traditions and autonomy that some professionals erroneously believe are necessary to make their work effective, profitable and pleasant" (Amalberti et al. 2005).

Are their beliefs erroneous – in particular, under the headings of profitability and pleasure? As Sheps and Cardiff (2005) note, the professional culture of medicine has deep roots in the mediaeval craft guilds and is remarkably consistent across regions and countries. Medicine is organized and governed the way it is because that is how physicians want it, and they have successfully fought off many efforts by others to change it. Financing is a permanent source of conflict in all countries, precisely because physicians' preferences inevitably collide with broader public objectives of access and cost control. "The 'abandonment of professional autonomy' (and, *inter alia*, the problems of professional self-regulation and control) is an essential lesson from high-reliability industries … . Related to the reduction or elimination of professional autonomy is the shift from the mindset of the craftsman to that of an 'equivalent actor'" (Sheps and Cardiff 2005: sec. 4.1). (It doesn't matter who the pilot – anaesthesiologist, surgeon? – is; they are interchangeable.) But this is a profession whose members are fiercely individualistic and deeply committed to autonomy.

A cynical old economist would bet that faced with the requirements of a serious commitment to high reliability, most clinicians will say, "The hell with it. We will not give up our centuries-old (and highly profitable) traditions just to avoid the occasional adverse event. Symbolic gestures, sure, and expressions of great concern – but only so long as we stay, individually, in control." After all, unlike pilots, clinicians do not share the fate of their patients.

How, then, to deal with the current concerns? A plausible strategy for deflection might be to conflate the concept of patient safety with the very different concept of quality of care. Then find some ignorant economist – there's no shortage – to tell the world that improved quality can be achieved only with more money. (The money = quality equation has a sorry history in health economics, now stretching over more than 30 years.) *Et voilà!* A potential threat to professional autonomy has been transmuted into yet another reason why healthcare needs more money – lead into gold.

Too cynical? Maybe, but let's wait and see.

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DISCUSSION AND DEBATE

Research Output of the Canadian Pharmaceutical Industry: Where Has All the R&D Gone?

Résultats de recherche dans l'industrie pharmaceutique canadienne : que sont devenus la recherche et le développement?

by NORMAN KALANT, MD, PHD
Professor, Department of Medicine, McGill University
Member, Department of Medicine, Sir Mortimer B. Davis – Jewish General Hospital
Montreal, QC

IAN SHRIER, MD, PHD
Assistant Professor, Department of Family Medicine, McGill University
Associate Member (Teaching), Department of Physiology, McGill University
Member, Centre for Clinical Epidemiology and Community Studies, Sir Mortimer B. Davis – Jewish General Hospital, Montreal, QC

Abstract

Although the Canadian pharmaceutical industry claims to be spending about $1 billion per year for research and development (R&D), there is little evidence of research performed, as measured by scientific publications and patent applications. One firm was exceptional; it compared favourably with its parent firm in regard to the number of publications and patents in relation to the R&D budget, demonstrating the feasibility of developing a productive and independent research program in Canada. The perception of low productivity is made worse by the inadequacy of the annual report on R&D prepared by the Patented Medicines Prices Review Board (PMPRB). We recommend a number of changes in the PMPRB's mandate so that its collection of R&D data and subsequent analysis will be more complete. Further financial assistance to the industry should be withheld until accountability is assured and a full assessment of the outcome of its R&D program can be made.

Résumé

Bien que l'industrie pharmaceutique canadienne prétende consacrer environ un milliard de dollars par an à la recherche et au développement (R&D), il existe peu de preuves sur les travaux de recherche réalisés, à en juger par les publications scientifiques et les demandes de brevet. Une firme a eu des résultats exceptionnels : elle s'est en effet comparée favorablement à sa société mère pour ce qui est du nombre de publications et de brevets comparativement au budget de R&D, démontrant qu'il est possible d'élaborer un programme de recherche productif et indépendant. L'impression d'une faible productivité est renforcée par le rapport annuel lacunaire sur la R&D préparé par le Conseil d'examen du prix des médicaments brevetés (CEPMB). Nous recommandons d'apporter un certain nombre de changements au mandat du CEPMB afin de lui permettre de se livrer à une collecte et une analyse de données plus complètes en matière de R&D. On devrait placer un moratoire sur l'aide financière accordée à l'industrie jusqu'à ce qu'on puisse instaurer un système adéquat de reddition de comptes et procéder à une évaluation complète des résultats de son programme de R&D.

THE PHARMACEUTICAL INDUSTRY HAS CONSISTENTLY ARGUED THAT THE high cost of research and development (R&D) of new medications necessitates a long period of patent protection (R&D 2001; DiMasi et al. 2003). The government responded in 1987 by increasing market exclusivity to 7 or 10 years and total patent duration to 17 or 20 years (depending on the source country of the chemicals to be used) before compulsory licensing was permitted (Table 1). In exchange for the increased protection, brand-name manufacturers committed their firms to increase R&D activity so that the R&D/S (sales revenue) ratio would increase from 4.9% in 1987 to 10% in 1996 (Office of the Auditor General of Canada 1998: para. 17.11). Further, passage of Bill C-91 in 1992 stopped compulsory licensing completely, prohibited generic companies from stockpiling ingredients or products in preparation for release to market after the patent protection ended and established the regulations concerning tax benefits for R&D. The current federal and provincial tax treatment and benefits associated with pharmaceutical R&D are more generous than those of any other nation (Warda 1999). There was a widely held conviction that these changes would result in an increase in the amount of basic pharmaceutical research done in Canada as well as an increase in jobs for degree-level scientists involved in that research (Côté 1986).

TABLE 1. Government Policy Changes

FAVOURING GENERIC FIRMS	FAVOURING BRAND-NAME FIRMS
1923: • Introduction of Compulsory Licensing **1969 Patent Act:** • Permitted importation of patented drug under compulsory license • Market exclusivity 7 years • Stockpiling ingredients to prepare for generic manufacturing	**1987 Bill C-22:** • 17 years of patent protection before compulsory licensing permitted • 7 years of market exclusivity included **1993 Bill C-91:** • Compulsory licensing abolished • 20 years of patent protection • Prohibited stockpiling ingredients to prepare for generic manufacturing • Evergreening* • Automatic Injunction** • Tax credit for R&D expenditure

*"Evergreening" is a term coined to describe the process of prolonging the period of market exclusivity by obtaining additional patents for what is essentially the same medication. The added patents may be for minor changes related to use (new dosage form or size), process of manufacturing or recognition of an active intermediate or active polymorphs and metabolites (Anderson 1997).

**New regulations (Bill C-91, passed in 1993) made approval by Health Canada to make and market a generic drug dependent on the patent status of the brand-name product with which it will compete; the generic maker must show that the patent has expired. If the patentee does not accept this claim, Health Canada is prohibited from approving the generic drug until both sides agree on the expiration, the dispute is settled in court or 24 months have elapsed. Since most settlements take at least 24 months, regardless of who is right, the process amounts to an automatic injunction against the generic firm (Anderson 1997).

Since both tax subsidies and patent protection are indirect expenses borne by society at large, it is reasonable for society to ask for an accounting of their costs and benefits. The purpose of this paper is to comment on the existing collaborations between the industry and the public sector with respect to both basic and applied research, our ability to measure research spending and productivity, and the actual levels of spending and productivity. The legislation referred to above defined the terms basic and applied research clearly and concisely: basic research is "work that advances knowledge without a specific application in view," while applied research is "that performed with a specific practical application in view" (Consolidated Statutes and Regulations of Canada 1979; PMPRB 2005). In the context of the pharmaceutical industry, the goal of applied research is to bring a new product to market with market exclusivity protected by a patent, and applied research includes all the steps from laboratory work to Phase III clinical trials done with that new product in mind.

Background[1]

Closed science to open science

The past 50 years have seen radical changes in the way the pharmaceutical industry searches for new drugs. The traditional process consisted of screening a large number of randomly selected compounds against laboratory models of disease or of pathological processes, then purifying for further study any that seemed promising. This work was performed in-house and was highly confidential (closed science). In the current mode of drug development (knowledge-based drug design), knowledge that has been derived from all sources and is now in the public domain is used to develop hypotheses concerning the structure and properties of a drug that would be effective in a specific clinical state; such a drug can then be synthesized and tested. Knowledge-based drug design, being dependent on the availability of knowledge generated by the work of scientists in the public sector, fosters closer ties between scientists in industry and in the public sector, and is referred to as "open science" (Zucker and Darby 1996, 1997; Dasgupta and David 1944).

By increasing the use of knowledge from the public domain, an open science policy carries a major economic benefit to the industry; quantitative estimates indicate that the rate of return from basic research is on the order of 25% to 40% (Adams 1990; Griliches 1994). For private sector firms the degree of benefit is highly dependent on the "connectedness" of their scientists with those in the "upstream" academic science community (Cockburn and Henderson 1997). The industry understands the importance of the relationship: virtually all firms performing research in the life sciences have some type of working relationship with a university, and 25% of faculty members in the life sciences departments received financial support from the industry for their research (Blumenthal 2003). However, there may be a price for such support. First, the establishment by the Medical Research Council and the Canadian Institutes of Health Research of "partnerships" between industry and academia has given the pharmaceutical manufacturers an opportunity to influence the direction of public sector research with little financial responsibility. Second, the dependence of scientists on research support from industry may lead some to bias their findings in favour of the drug firm (Bekelman et al. 2003). Finally, while one of the expected benefits of open science is greater communication among scientists, the development of close and exclusive academic-industrial ties may actually reduce communication.

Research spending

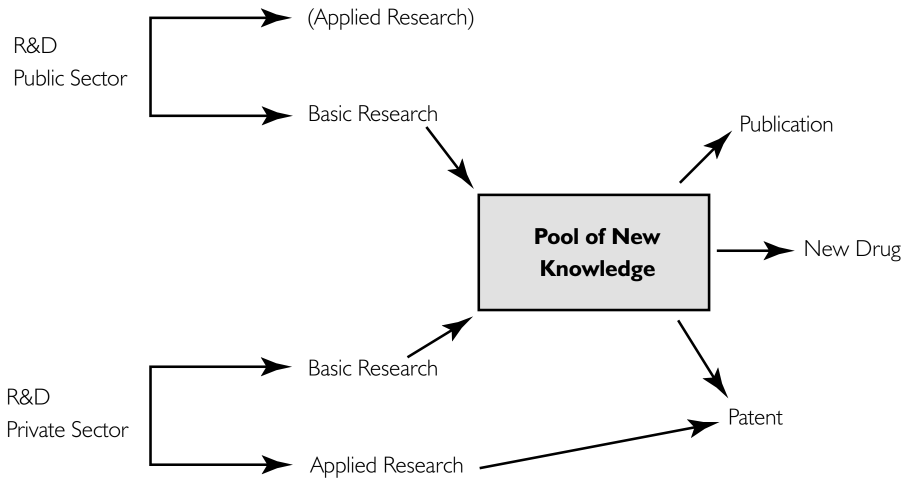
In response to Bill C-22, the member companies of the Pharmaceutical Manufacturers Association of Canada (PMAC; now named Rx&D) committed their firms to increase R&D expenditures as a percentage of sales to 10% by 1996 (Office of the Auditor General of Canada 1998: para. 17.11). The collection and reporting of information on R&D expenditures became the responsibility of the newly created Patented Medicines Prices Review Board (PMPRB). Although the 10% goal was achieved on time, the ratio has declined each year since. In 1999, spending in Canada was lower than in all countries in the G-7 except Italy (expressed as absolute amount, per capita amount, or percentage of domestic sales). Currently, it is well below the aggregate ratio for the smaller European countries too, although it does remain above its pre-1987 level (PMPRB 2002).

It must be noted that the above figures represent a best-case scenario because the PMPRB's analysis is limited. First, it receives information only on firms that sold patented medicines during a given calendar year. Second, the PMPRB does not have the authority to audit the figures submitted to it. Finally, there have been several mergers (Reger 2001; Tarabusi and Vickery 1998), particularly among the large firms, with centralization of small facilities (including Canadian subsidiaries) and loss of jobs. Consequently, determining the effect of Bills C-22 and C-91 on the creation and maintenance of research-related jobs has not been possible.

Measuring research output

Both basic and applied research lead to new knowledge, and the relationship between the two is shown in Figure 1. New knowledge obtained through basic research leads to publications, and new knowledge obtained through applied research leads to new drugs/methodologies and consequently new patents. Patent counts have been used frequently as indicators of output of R&D (OECD 1994; Hinloopen 2003; Adams and Griliches 1997). Further, patents are obtained to protect the ownership of the patented item. As there is no benefit to protecting an idea or observation that cannot contribute to drug development, all research leading to a patent application is, by definition, applied research. That being said, a measure using only patent information would underestimate total productivity because some applied research results may not help towards obtaining a patent but the results may still be worthy of publication.

FIGURE 1. Hypothesized relationships among research, the shared pool of scientific knowledge and applied research



Knowledge derived from basic research is available to all. When appropriate, new knowledge may be described in a scientific publication; occasionally, it may bring other information together and lead to a new drug or to a higher level of understanding that is patentable. The category "(Applied Research)" indicates that there is little research in the public sector that is undertaken with the purpose of developing a new medication.

Output of pharmaceutical research in Canada

We compared the major Canadian subsidiaries to their multinational parent firms regarding number of publications and number of patent applications, corrected for differences in R&D expenditures (Table 2) and the number of important new drugs marketed before and after Bill C-91 was passed (Table 3). Sources of information and details of methodology are given in the appendix to this paper. In brief, with the clear exception of Merck Frosst Canada, the subsidiaries had many fewer publications and patent applications per dollar of R&D, and there was no increase in the total number of new or Category 2[2] drugs per year after approval of Bill C-91. In contrast, the number of new drugs in the USA increased by 63% for the same period (Hunt 2002).

Discussion

Prior to Bill C-22, there was a widespread view that the low level of R&D spending in Canada was a response to our "hostility" towards the pharmaceutical industry. Although the Canadian tax treatment of R&D is now more generous than that of any other nation (Warda 1999), there has been no increase in the production of basic research, in the rate of introduction of new drugs or in the relative number of

TABLE 2. Publications and patent applications of parent firms and Canadian subsidiaries (1998–2004)

PARENT	R&D[1]	PUB[2]	PAT[3]	(PAT+PUB)/(R&D)
ABBOTT	10,284	2,996	733	0.36
ASTRAZENECA	18,102	3,433	790	0.23
AVENTIS PHARMA	19,884	2,623	1096	0.19
BRISTOL-MYERS SQUIBB	14,356	2,399	610	0.21
JOHNSON & JOHNSON	25,814	1,043	496	0.06
MERCK	18,554	7,282	1500	0.47
NOVARTIS PHARMA	25,652	5,420	760	0.24
PFIZER	36,614	4,516	835	0.15
WYETH	12,862	2,060	421	0.19
SUBSIDIARY	R&D[1]	PUB[2]	PAT[3]	(PAT+PUB)/(R&D)
ABBOTT LABORATORIES	63	0	0	0
ASTRAZENECA CANADA	506	18	1	0.04
AVENTIS PHARMA	267	2	0	0.01
BRISTOL-MYERS SQUIBB CANADA	316	2	0	0.01
JOHNSON & JOHNSON MERCK	0	0	0	0
MERCK FROSST CANADA	690	194	211	0.59
NOVARTIS PHARMA CANADA	334	6	0	0.02
PFIZER CANADA	815	24	0	0.03
WYETH AYERST CANADA	277	0	0	0

1 Research and development expenditure ($000s)
2 Publications in scientific and professional journals
3 Number of patents applied for

TABLE 3. New drugs marketed since patent law enacted

	CATEGORY 2 / PRIORITY NME*		OTHER	
	1989–1994	1995–2000	1989–1994	1995–2000
Canada	36	26	477	521
USA	73	80	277	489

*Category 2 for Canada; Priority NME for US

Category 2 drugs. Because the Canadian pharmaceutical industry is again lobbying for more patent protection, less stringent price controls and better tax treatment for R&D expenditure as methods to promote R&D and make Canada a leader in drug development (Rx&D 2004), we believe it is important to understand why the previous legislation did not achieve its objectives.

With respect to basic research productivity, it is possible that we omitted basic research undertaken extramurally and credited to other organizations (e.g., hospitals and universities). However, the results of basic research have no immediate commercial value, need not remain confidential and thus would be publishable in the public domain. Further, authors are required to acknowledge the sponsoring company in the publication. We therefore believe it unlikely that we missed more than the occasional title. Although many pharmaceutical manufacturers engage other private companies to perform Phase I trials and targeted drug development, this is applied research by definition. Finally, because we are comparing Canadian and parent companies, any omission due to our methodology would affect the conclusions of the analysis only if it applied solely to the Canadian company or the parent company but not both; we believe this is unlikely.

With respect to applied research, one possible reason for the parent–subsidiary difference is that the development of new drugs targeted to the Canadian population may not be economical; an OECD study (Burstall et al. 1981) and the Eastman report (Commission of Inquiry on the Pharmaceutical Industry 1985) emphasized the small size of the Canadian market, the high cost of an independent research establishment and the efficiency of obtaining information and technology from established programs. Parent firms with only a minimal intramural research program in Canada may therefore have decided, as a matter of policy, that any promising development originating from these small operations would be transferred to the parent research centre. However, the experience of Merck Frosst Canada Research Institute provides clear evidence of the feasibility of creating a Canadian research enterprise under current conditions, and the success of Premarin and Vioxx demonstrates that a drug developed in Canada may have access to the same broad market as that available to the parent firm. Finally, regardless of the reason, failure to observe a time-dependent increase in research output suggests that increased patent protection and tax credits did not accomplish the stated goals, and "more of the same" (Rx&D 2004) is unlikely to produce a better result.

Limitations of the analysis

It was not possible to analyze the basic and applied research spending separately by location (intramural, hospitals and universities, other companies). The PMPRB reports provide only aggregate spending by type of research (basic or applied) or by location (Tables 15/16 in the 2004 report), but not both. We are also concerned with the PMPRB's classification of basic and applied research. Table 15 of its 2004 report appears to classify all production process or pre-clinical/clinical trials as applied research, and all laboratory-based research as basic science. This classification is incompatible with the currently recognized definitions described above. For any division of R&D into "basic" and "applied" research to be valid, these terms must be used consistently and accurately. These problems would be solved if the list of projects and resulting publications supported by the pharmaceutical firms is made public. Finally, all figures are based on what is provided by the industry because the PMPRB does not have the authority to verify the reported R&D expenditures. This is an obvious concern in the evaluation of a government program designed to meet specific targets.

The Auditor General has also noted that the PMPRB was established under the Patent Act (1992), while the R&D expenditures eligible for tax benefits are those that would have been eligible under the income tax legislation in effect on December 1, 1987. Because income tax regulations have changed several times since 1992 (new legislation is applicable to all non-pharmaceutical industries), the tax credit for R&D in the pharmaceutical industry is now unclear (Office of the Auditor General of Canada 1998: para. 17.67–17.69). This problem could be avoided by placing the pharmaceutical R&D tax expense regulations within the Income Tax Act, as is currently the case for all other industries.

Recommendations

Traditionally, government subsidies and tax initiatives are used to help industries that are considered strategically important in the overall national economy and that are in temporary financial difficulty. Although the pharmaceutical industry itself is expected to argue forcefully for every advantage, Canadians must decide whether continuing to subsidize the pharmaceutical industry at the expense of other parts of the economy is in their best interest. Should government increase the profits of an already profitable endeavour? How should we rate the importance of an industry when the large majority of its new products offer little or no advantage over those already available (Table 3)? If other industrialized countries provide subsidies, how "competitive" are we willing to be to induce the large firms to locate in our jurisdiction? To make these decisions, we must have valid and adequate data on the present situation; and if we decide to continue to subsidize this industry, we must be assured of obtaining unambiguous data to determine whether legislative objectives are being met. We recommend that the following steps be taken to ensure the availability of such information:

1. All pharmaceutical manufacturers that submit claims for tax credits for R&D to Revenue Canada must provide information to the PMPRB (current legislation

requires only Rx&D members to do so).

2. The PMPRB must have the authority and the budget to verify the claims submitted.
3. Each firm must provide the PMPRB with the amount of support for (a) each basic research project (non-confidential, by definition) and the publications resulting from them and (b) each applied research project that results in publication or patent applications. The list of projects should be divided into subgroups by research location (intramural, hospitals and universities, other companies) to allow an assessment of the quantity and quality of the research done by each group.
4. The tax laws pertaining to the research expenditures of the pharmaceutical industry should follow the tax laws of all other industries.

Summary

After initially raising R&D spending to a previously determined level, the Canadian pharmaceutical industry has steadily lowered its expenditure. Further, based on available data, longer patent protection and increased R&D spending do not appear to have increased research productivity. The industry is again requesting increased tax breaks and extended patent protection. We believe that continuation of present tax and patent support and any future benefits should be considered only when a proper system of accountability is available.

NOTES

1. This background information is based on Gambardella 1995 and Cockburn and Henderson 1997.

2. A Category 2 drug is one that is the first to treat effectively a particular illness or that provides a substantial improvement over existing drug products; often referred to as a "breakthrough" drug.

Appendix

Methods and results

Canadian subsidiaries were compared to their parent companies with regard to the number and category of new drugs marketed, the number of patents and scientific publications and the expenditure on R&D.

Number and category of new drugs

Hunt (2002) examined the level of innovation of new drugs approved by the FDA in the period 1989–2000 using the categories shown in Table 4. To determine whether there was a change during that period he compared the data for 1989–1994 with those for 1995–2000. We compared the drugs approved by the PMPRB with the US results for the same periods. In the United States, there was a 63% increase in the number of new drugs marketed in the second period; all were of "ordinary" priority. In Canada, there was no significant change in either the total number of new drugs or in Category 2 drugs (Table 3).

TABLE 4. Classification of approved drugs

UNITED STATES (FDA)

New Molecular Entity
Drug whose active ingredient has never before been approved by the FDA for the US market

Incrementally Modified Drug
Medicine that relies on an active ingredient present in a drug already approved (or a closely related chemical derivative), and has been modified by the manufacturer

Other Drug
Drug using an active ingredient that is already available in an identical marketed product

Priority Drug
A product qualifying for the FDA's fast "priority review" because it appears to offer clinical improvement over available products and therapies in efficacy, safety, compliance, or use in a new sub-population

Standard Drug
A product that does not qualify for "priority review" because it does not demonstrate significant improvement over marketed products

CANADA (PMPRB)

New Active Substance

Category 2
The first drug to treat effectively a particular illness, or which provides a substantial improvement over existing drug products

Category 3
A new drug or new dosage form of an existing medicine that provides moderate, little or no improvement over existing medicines

Category 1
A new DIN of an existing or comparable dosage form off an existing medicine, usually a new strength of an existing drug

Number of scientific publications and of patent applications

This and the following comparison were limited to the firms that were most consistently among the 10 largest with regard to sales in the US market, and that published an annual report for the US corporation or for the US component of a European corporation. For each firm, we obtained the number of publications in which the institutional affiliation (as a search term) of one or more authors was the pharmaceutical firm of interest. Using this search strategy, we did a simultaneous search of the databases Current Contents, Embase and Medline, then eliminated the duplications to get a corrected total. Using annual sales figures provided by IMS Health and R&D/S ratios as reported by PMPRB, we calculated the R&D expenditures of the Canadian subsidiaries; expenditures of the parent firms were taken from their annual reports. The number of patent applications for the period 1998–2004 was obtained by searches of the Canadian Patents Database of the Canadian Intellectual Property Office, using keyword searches in the advanced search option. The searches were performed with the name of the firm in the "owner" field. Total values for publications, patent applications and R&D expenditures for the period 1998–2004 are shown in Table 2. An approximation of research efficiency is given by the ratio of the sum of publications and patents (units of output) to R&D expenditure. Only the Merck subsidiary had a ratio of the same magnitude as the parent firm; the others had ratios 1/20th to one-fifth as large as the parent ratios.

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Correspondence may be directed to: Dr. N. Kalant, #404-18 Lower Village Gate, Toronto, ON M5P 3M1. Email: nkalant@sympatico.ca

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Call to Authors

Discussion and Debate

The Discussion and Debate section of *Healthcare Policy* offers a forum for essays and commentaries that address: (1) important health policy or health system management issues; or (2) critical issues in health services and policy research. Submissions should be a maximum of 2,000 words exclusive of (no more than 20) references. The main points of the paper should be highlighted in an abstract (summary) of 100 words or less.

Appel aux auteurs

Discussion et débat

La section « Discussion et débat » de *Politiques de santé* offre un forum pour la publication de comptes rendus et de commentaires portant sur les sujets suivants : (1) d'importantes questions liées aux politiques de santé ou à la gestion du système de soins de santé; ou (2) des questions cruciales concernant les services de santé et la recherche sur les politiques. Les articles devraient être d'au plus 2000 mots, sans compter les références (pas plus de 20). Les points saillants de l'article devraient être mis en évidence dans un résumé (sommaire) de 100 mots ou moins.

For more information contact Rebecca Hart, Managing Editor, at rhart@longwoods.com.

DATA MATTERS

Missed Opportunity: Patients Who Leave Emergency Departments without Being Seen

Occasions manquées : les patients qui repartent des services d'urgence sans avoir été examinés

by AKERKE BAIBERGENOVA, MD, MPA, PHD
Senior Analyst, Health Services Research
Canadian Institute for Health Information
Toronto, ON

KIRA LEEB, BA, HON. BA, MA
Manager, Health Services Research
Canadian Institute for Health Information
Toronto, ON

ALEKSANDRA JOKOVIC, BDS, MHSC, PHD
Project Lead, Health Services Research
Canadian Institute for Health Information
Toronto, ON

SHARON GUSHUE, BSC, MSC
Senior Analyst, Health Services Research
Canadian Institute for Health Information
Toronto, ON

Akerke Baibergenova, Kira Leeb, Aleksandra Jokovic and Sharon Gushue

Abstract

The rate of patients who visit emergency departments (EDs) but leave before being evaluated and treated is an important indicator of ED performance. This study examines patient- and hospital-level characteristics that may increase the risk of patients leaving EDs before being seen. The data are from the National Ambulatory Care Reporting System, an administrative database, and represent 4.3 million patient visits made to 163 Ontario EDs between April 2003 and March 2004. Among these data, the proportion that left without being seen (LWBS) was 3.1% (136,805). The rate of LWBS was highest among patients aged 15 to 35 years, those with less acute conditions and facilities that handle the highest volume of patients. Facility rates were positively correlated with facility median ED length of stay, annual facility volume and percentage of inpatient admissions. Understanding patient and facility characteristics that increase rates of LWBS may inform the process of developing measures to ensure timely access to ED care for all who seek it.

Résumé

Le taux de patients qui se présentent dans un service d'urgence, mais en repartent avant d'avoir été examinés et traités est un élément révélateur important de la performance d'un service d'urgence. La présente étude se penche sur les caractéristiques des patients et des hôpitaux qui sont susceptibles d'augmenter le risque que les patients repartent des services d'urgence sans avoir été examinés. Les données sont issues de la base de données administrative qu'est le Système national d'information sur les soins ambulatoires et représentent 4,3 millions de visites effectuées dans 163 services d'urgence en Ontario entre avril 2003 et mars 2004. D'après ces données, le taux de patients qui sont repartis sans avoir été examinés était de 3,1 % (soit 136 805 patients). Ce taux était le plus élevé chez les patients âgés de 15 à 35 ans, chez ceux n'étant pas dans un état très grave et dans les établissements qui traitent le plus de patients. Les taux par établissement étaient étroitement liés à la durée moyenne passée dans le service d'urgence, le volume et le pourcentage annuels de malades hospitalisés des établissements en question. Connaître les caractéristiques des patients et des éta-blissements qui font augmenter le taux de patients qui repartent sans avoir été exa-minés pourrait être utile pour mettre en place des mesures visant à rendre les services d'urgence accessibles en temps opportun à toute personne qui en a besoin.

* * *

A SMALL BUT IMPORTANT FRACTION OF PATIENTS WHO GO TO EMERGENCY departments (EDs) never get care because they leave before being evaluated and treated. The rate at which this occurs is an indicator of ED performance

(US General Accounting Office 2003). In the United States in 2001–2002, between 1.4% and 1.9% of patients left EDs without being seen (McCaig and Burt 2004; US General Accounting Office 2003). In Australia, the rate in 2003–2004 was reported to be higher (5.2%; Australian Institute of Health and Welfare 2005). In Canada, published estimates based on single-facility studies are 1.4% (Fernandes et al. 1994) and 3.6% (Monzon et al. 2005).

Internationally, studies of factors associated with patients leaving EDs before being seen have focused on patient- and hospital-related issues. For example, acute psychological distress at the time of visit (Weissberg et al. 1986), pressing commitments elsewhere (Fernandes et al. 1994), perceived poor communication with staff (Fernandes et al. 1994; Arendt et al. 2003) and low acuity with spontaneous resolution of symptoms while waiting (Goldman et al. 2005) are some of the patient-related factors that have been documented to date. A hospital-related factor identified in many studies is prolonged waiting time to see a physician (Fernandes et al. 1994; US General Accounting Office 2003; Kyriacou et al. 1999).

This study investigates how often patients leave Ontario EDs without being seen (LWBS) and considers both patient- and facility-level factors that may be associated with increased risk for LWBS.

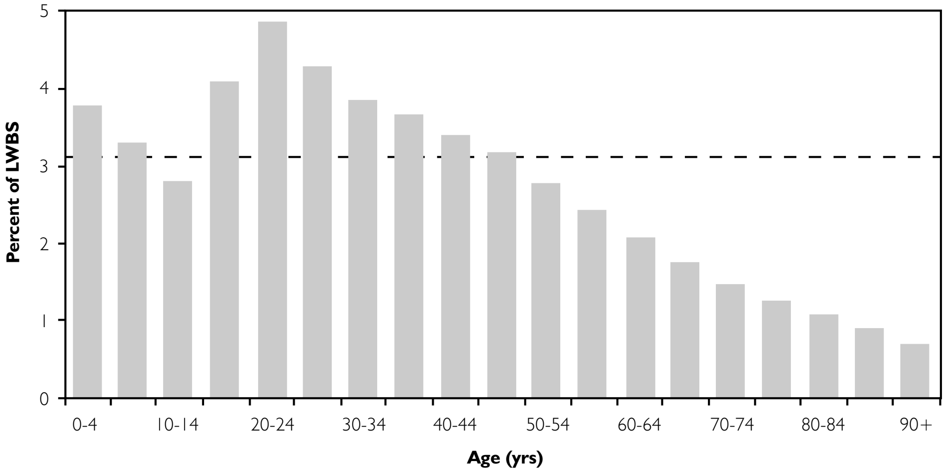
Methods

Our analysis included records of 4.3 million visits to 163 Ontario EDs that took place between April 1, 2003 and March 31, 2004 obtained from the National Ambulatory Care Reporting System (NACRS) database of the Canadian Institute for Health Information (CIHI). LWBS patients were identified through the documented visit disposition. They had either registered but left before being triaged or were triaged but left before being seen by a physician. Patient characteristics examined included gender, age, triage score and length of stay in the ED (EDLOS). Triage score was based on the Canadian Triage and Acuity Scale (CTAS). It is a five-point scale with the following values: 1 – resuscitation required; 2 – emergent care required; 3 – urgent care required; 4 – semi-urgent care required; and 5 – non-urgent care required (Beveridge et al. 1999). The EDLOS was calculated as the difference between the time of registration or triage (whichever came first) and the time of visit completion. Potential associations between individual facility characteristics (annual volume of ED visits, percentage of inpatient admissions and overall median EDLOS) and their LWBS rates were estimated through Pearson's correlation coefficient (r).

Results

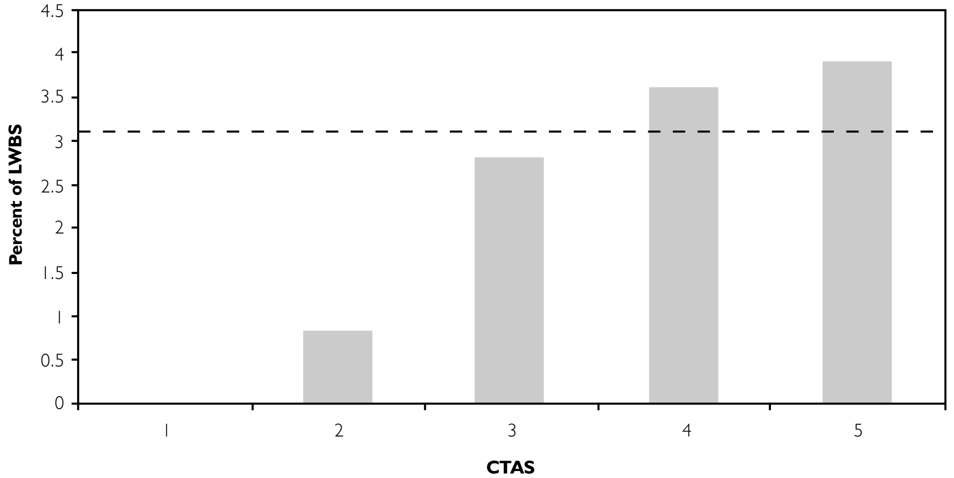
In 2003–2004, 3.1% (n=136,805) of patients who went to Ontario's EDs left without

FIGURE 1. Percentage of patients who left without being seen (LWBS) by age



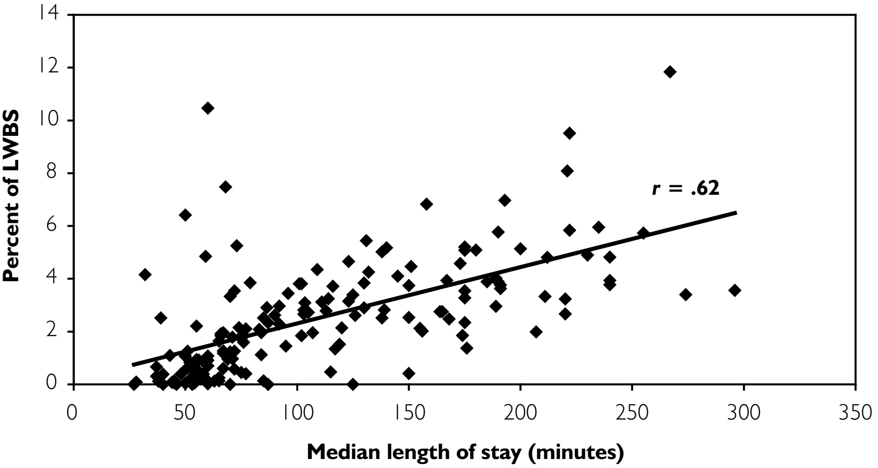
Note: Data represent visits to 163 Ontario-based emergency departments between April 1, 2003 and March 31, 2004.
Source: National Ambulatory Care Reporting System, CIHI

FIGURE 2. Percentage of patients who left without being seen (LWBS) by acuity level



Note: Data represent visits to 163 Ontario-based emergency departments between April 1, 2003 and March 31, 2004.
Source: National Ambulatory Care Reporting System, CIHI

FIGURE 3. Relationship between the percentage of patients who left without being seen (LWBS) and median lengths of stay



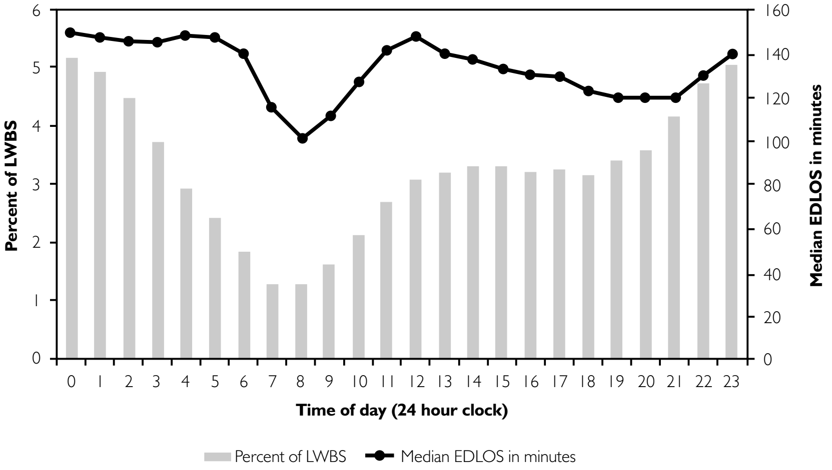
Note: Data represent visits to 163 Ontario-based emergency departments between April 1, 2003 and March 31, 2004.
Source: National Ambulatory Care Reporting System, CIHI

being seen by a physician. This percentage ranged from 0.1% to 12% among facilities across the province. Analysis of patient records indicated that the annual return rate to EDs for LWBS patients was 5.5%. Of those that returned, 21% returned within 72 hours to a facility.

Males and females were equally likely to leave EDs without being seen, but there was considerable variation by age, with LWBS rates being highest among those 15–35 years old (Figure 1). Patients with CTAS scores of 4 and 5, corresponding to less urgent conditions, were also more likely to leave before being seen than those triaged with more urgent CTAS scores (e.g., 2 and 3). Overall, high-volume EDs (those with annual patient visit volume of more than 30,000) and teaching hospital EDs had higher rates of LWBS patients (3.7% and 3.1%, respectively) than either medium-volume EDs (2.6%; annual patient visit volume between 15,000 and 29,999) or low-volume EDs (1.8%; annual patient visit volume under 15,000). The median time LWBS patients spent in the ED before leaving (103 minutes) was double that of the median time that those who stayed and were treated waited to be seen by a physician (51 minutes).

Facility characteristics such as the annual volume of ED visits, percentage of inpatient admissions and median EDLOS were all positively correlated with LWBS rates. However, the facility median EDLOS showed the strongest correlation with

FIGURE 4. Circadian distributions of patients who left without being seen (LWBS) and median lengths of stay (EDLOS)



Note: Data represent visits to 163 Ontario-based emergency departments between April 1, 2003 and March 31, 2004.
Source: National Ambulatory Care Reporting System, CIHI

percentage of patients who left without being seen: r=.62 (Figure 3). The strength of this correlation was further demonstrated by similar circadian distributions of median EDLOS and LWBS rates (Figure 4). Overall, patients were more likely to leave when the median EDLOS was longest (around midnight) and least likely to leave when the median EDLOS was shortest (between 7 and 9 a.m.).

Conclusion

The percentage of LWBS patients has recently been proposed as an indication of ED overcrowding (Weiss et al. 2005). It has also been suggested as a measure of patient satisfaction with ED services (Fernandes et al. 1994; Arendt et al. 2003). In this large population-based study we found that approximately 3% of patients who went to Ontario EDs in 2003–2004 left before being seen by a physician. Both patient and healthcare facility characteristics were related to increased rates of LWBS patients. For example, being 15–35 years of age, having higher triage scores (i.e., less urgent conditions), visiting teaching and high-volume EDs and time of visit were all related to increased rates of LWBS. Understanding the factors that contribute to higher rates of LWBS within facilities can help ensure adequate provision of needed services.

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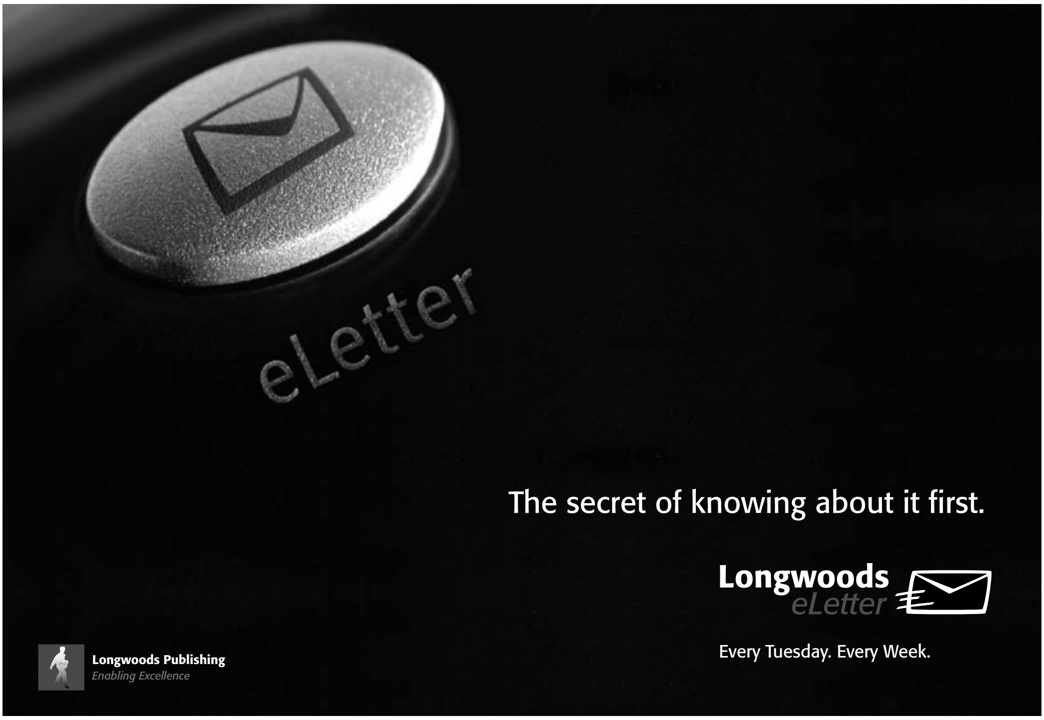
Call to Authors

Data Matters presents brief, focused papers that report analyses of health administrative or survey data that shed light on significant health services and policy issues. Submissions to Data Matters should be a maximum of 1,500 words, exclusive of tables, figures and references, and should include no more than three tables or figures.

Appel aux auteurs

« Questions de données » présente de brefs articles portant sur des analyses de données administratives sur la santé ou de données d'enquête et qui font la lumière sur d'importantes questions liées aux services et aux politiques de santé. Les articles soumis à « Questions de données » doivent être d'au plus 1 500 mots, excluant les tableaux, diagrammes et références et ne doivent pas comprendre plus de trois tableaux ou diagrammes.

For more information contact Rebecca Hart, Managing Editor, at rhart@longwoods.com.



Linkage and Exchange

The case study presented here is drawn from a recent publication from the Canadian Institutes of Health Research: *Moving Population and Public Health Knowledge into Action* by the CIHR Institute of Population and Public Health, and the Canadian Population Health Initiative. This knowledge translation casebook highlights original submissions from across Canada that focus on lessons learned from both successful, and less than successful, knowledge translation activities. Designed as a means for researchers and decision-makers to share and recognize their experiences, this casebook also demonstrates the impact that research can have in shaping policy, program, and practice changes.

The casebook was published in early 2006. Please visit CIHR's website at www.cihr-irsc.gc.ca for more details.

L'étude de cas présentée ici est tirée d'une récente publication des Instituts de recherche en santé du Canada intitulée : *Mise en application des connaissances sur la santé publique et des populations*, produite par l'Institut de la santé publique et des populations (ISPP) des IRSC et l'Initiative sur la santé de la population canadienne (ISPC). Ce recueil de cas d'application des connaissances contient des résumés de cas envoyés par des auteurs de partout au Canada et illustrant les leçons tirées d'initiatives fructueuses ou non d'application des connaissances. Conçu pour permettre aux chercheurs et aux décideurs de partager et de reconnaître leurs expériences, le recueil démontre aussi les répercussions possibles de la recherche sur la façon dont les changements sont apportés aux politiques, aux programmes et à la pratique.

Le recueil de cas a été publié au début de 2006. Pour plus de détails, consulter le site Web des IRSC à www.cihr-irsc.gc.ca

The Manitoba First Nations Centre for Aboriginal Health Research: Knowledge Translation with Indigenous Communities

Manitoba First Nations Centre for Aboriginal Health Research: l'application des connaissances dans les communautés autochtones

by BRENDA ELIAS, PHD
Manitoba First Nations Centre for Aboriginal Health Research
University of Manitoba, Winnipeg, MB

JOHN O'NEIL, PHD
Department of Community Health Sciences
University of Manitoba, Winnipeg, MB

Abstract

Knowledge translation at the Manitoba First Nations Centre for Aboriginal Health Research emerged through several population health research initiatives conducted in partnership with Canadian Indigenous peoples. An initial collaboration to carry out a regional health survey laid the foundation to share leadership, power and decision-making, and resulted in a program to build capacity in the First Nations health planning community through familiarity with the tools and skills of health researchers. Connections between health researchers and First Nations health planners have since led to the incorporation of evidence-based decision-making in many First Nations communities.

Résumé

L'application des connaissances au *Manitoba First Nations Centre for Aboriginal Health Research* [centre des Premières nations pour la recherche sur la santé des Autochtones du Manitoba] découle de plusieurs initiatives de recherche sur la santé de la population menées en partenariat avec les peuples autochtones canadiens. Une première collaboration, dans le cadre d'une enquête régional sur la santé a permis de jeter les fondements d'un partage du leadership, des pouvoirs et du processus décisionnel, et a mené à la création d'un programme visant à renforcer les capacités des planificateurs des services de santé des Premières nations par la familiarisation avec les outils et les compétences des chercheurs en santé. Les liens de collaboration entre les chercheurs et les planificateurs en santé des Premières nations ont, depuis, mené à un processus décisionnel fondé sur l'expérience clinique dans plusieurs de ces communautés.

* * *

Knowledge translation (KT) at the Manitoba First Nations Centre for Aboriginal Health Research (MFN-CAHR) involves the exchange, synthesis and ethically sound application of knowledge in a complex set of interactions among health jurisdictions, Indigenous groups, researchers, policy makers, program developers and healthcare service providers. MFN-CAHR's commitment to KT grew out of several population health research initiatives conducted in full partnership with Canadian Indigenous peoples.

Historically, First Nations health planners and service providers did not have access to trustworthy health information based on the best available research. Most health information was housed within universities and governments, which were inaccessible to First Nations communities. In the mid-1990s, MFN-CAHR and the Assembly of Manitoba Chiefs (AMC) entered into a research partnership with the Assembly of First Nations to implement the provincial component of the national First Nations Regional Longitudinal Health Survey.

A key KT product of this survey was the First Nations Applied Population Health Research Summer Institute, which introduced population health research approaches to First Nations healthcare directors and providers. Together, these initiatives contributed to new research and KT networks dedicated to reducing health disparities in First Nations communities in Manitoba.

The KT Initiative

The partnership struck to carry out the regional health survey laid the foundation to share leadership, power and decision-making from design to KT. The survey was successfully launched and achieved a high response rate.

At the dissemination stage of the survey, MFN-CAHR and AMC realized that First Nations health directors and providers would greatly benefit from an opportunity to work directly with the survey data to answer policy-related questions for their tribal areas and communities. Funding was secured from Health Canada's National Health Research and Development Program, and MFN-CAHR and AMC successfully offered the First Nations Applied Population Health Research Summer Institute for one week each summer over three years to First Nations health planners. The goal of the institute was to build "receptor" capacity in the First Nations health planning community through familiarity with the tools and skills of health researchers. Additionally, the institute sought to increase First Nations' interest in using the survey results by modelling the process of answering complex health policy questions through the process of data analysis. For example, participants were asked to develop questions that they thought their communities would like to have answered (e.g., "Who is most at risk for diabetes in the community?"), and then survey and provincial health data were analyzed in a workshop format to answer such questions.

Today, MFN-CAHR and affiliated researchers and partners are engaged in a wide range of research activities designed to benefit Indigenous communities. Research now extends across the four pillars of the Canadian Institutes of Health Research (CIHR) – biomedicine, clinical practice, health systems and services, population and public health – and reflects a strong participatory relationship with Indigenous communities in Manitoba, Canada, North America and internationally. Specific CIHR-funded projects include biomedical and clinical studies of diabetes, osteoporosis, rheumatoid arthritis and asthma; health systems studies of governance in community services; and broad investigations of the social determinants of community well-being, including studies of social capital, cultural continuity and resilience in the Aboriginal workforce. All these studies involve Indigenous partners from planning and design through implementation and dissemination.

Our KT model is based on the principle that research users must not only participate in the research process from the beginning, but must exercise a degree of control or ownership over the research process if the results are to be seen as meaningful and useful. We engage Indigenous groups, government policy makers, program developers and providers across multiple health jurisdictions, academic disciplines and research areas in a series of workshops and meetings both to guide the research process and to ensure that potential users are familiar with the research results and their policy relevance.

Results of the KT Experience

These initiatives have fostered new social connections between university-based health researchers and First Nations health planners and led to opportunities to incorporate evidence-based decision-making in First Nations communities. Many First Nations health planners in Manitoba have now made population health research a critical part of their health governance structures and participate in research networks dedicated to addressing health disparities in First Nations communities.

These initiatives also fostered the development of health information systems. The creation of databases derived from both health surveys and provincial healthcare utilization data has been identified as a priority by First Nations authorities, who recognize the potential for building an evidence base for policy claims on different levels of government. Previously, this initiative was important only to university-based researchers, but the push is now mainly from the First Nations community.

Many First Nations health planners in Manitoba have now made population health research a critical part of their health governance structures …

The early success of the MFN-CAHR and AMC partnership has led to the development of new research space at the University of Manitoba, funded by the Canada Foundation for Innovation, and an Aboriginal Capacity and Development Research Environment grant from CIHR's Institute of Aboriginal Peoples' Health. Both grants emphasize the need for research to be structured by a university–community partnership and for KT to be a critical aspect of all research activities. They also focus on capacity building by providing both space and resources to attract Aboriginal peoples into the health research process.

New research space and a dedicated research group have fostered new research networks, many of which have applied to CIHR to undertake studies with KT as a central component. New researchers now have access to the expertise required to establish successful research studies with Indigenous communities.

Lessons Learned

Perhaps somewhat ironically, the success of our KT activities has led to a situation where the demands for researcher involvement in the First Nations policy and planning process have outstripped the capacity of researchers at MFN-CAHR to respond. First Nations authorities in Manitoba constantly need to generate information to support their claims on federal and provincial governments for healthcare resources. Expectations are now that MFN-CAHR resources can be deployed to answer some of these questions in timely ways, but the relationship has been threatened by the reality of equally compelling, university-based demands on the researchers.

Most importantly, much KT activity is still funded at the margins of research grants. MFN-CAHR receives no dedicated funds from any agency to support KT activities. Research grants from CIHR and other funders acknowledge the need for KT, but the time and cost of these activities are rarely funded at the necessary level. Researchers, particularly in a young organization, are also mindful of the realities of advancement in the university, where traditional academic progress is rewarded over community-oriented activities.

The ownership and control of research data is also a contested area. First Nations in Canada have established a set of principles known as OCAP (ownership, control, access and possession of research data) that they expect to govern the relationship between researchers and First Nations communities and authorities. MFN-CAHR was instrumental in developing these principles in the late 1990s in the context of implementing the regional health survey. Similar principles were included in the early research contracts between MFN-CAHR and the AMC, providing a foundation for the development of a trusting relationship.

Most importantly, much KT activity is still funded at the margins of research grants. MFN-CAHR receives no dedicated funds from any agency to support KT activities.

Reaching agreement around OCAP principles, however, can delay and even curtail research and KT activities. In particular, "possession" of databases generated by provincial or federal data stewards is highly problematic, given confidentiality and privacy legislation. Data generated by researchers must also be protected for the privacy of research participants. Balance is required to avoid exclusionary approaches by either partner, which can foster distrust, lack of participation and conflict. The principles of mutual respect, the privacy and confidentiality of information at the individual and sub-group level and mechanisms for conflict resolution should therefore form an integral part of research agreements. Our experience suggests that when an organization such as MFN-CAHR is trusted by all partners as an appropriate data steward, then OCAP issues fade somewhat into the background. But when the capacity for ongoing KT activities is limited, this trust can be compromised.

Conclusions and Implications

The time and resources required for KT are significant, and researchers and partners need to understand both the opportunities and the limitations on this kind of activity.

Researchers also need to be appropriately supported to make this investment in terms of both funding and reward systems in the university and with partners. In addition, community partners require resources in order to engage effectively in the KT process. Successful KT, conducted on the margins of research grants, should be celebrated, but it may not be sustainable and may compromise the fundamental character of the partnership if expectations exceed capacity.

Correspondence may be directed to: Brenda Elias, Manitoba First Nations Centre for Aboriginal Health Research, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba, 7th Floor - 715 McDermot Avenue, Winnipeg, MB, R3E 3P4; Tel: (204) 789-3358; Fax: (204) 975-7783; Email: elias@ms.umanitoba.ca.

Call to Authors

Linkage and Exchange provides a forum for knowledge translation (KT) case studies. Submissions should include an abstract of no more than 100 words, a brief statement of background and context, a description of the KT initiative, a presentation of results (including challenges that arose and how they were addressed) and a discussion of lessons learned, highlighting those that are potentially transferable to other topics and settings. Manuscripts should be a maximum of 2,000 words, excluding the abstract and references.

Appel aux auteurs

« Liens et échanges » fournit un forum pour des études de cas en application des connaissances (AC). Les articles soumis doivent comporter un résumé d'au plus 100 mots, une brève mise en contexte, une description de l'initiative d'AC, une présentation des résultats (y compris les défis qui se sont présentés et comment ils ont été relevés), ainsi qu'une discussion des leçons apprises, surtout celles qui sont potentiellement transférables à d'autres sujets et à d'autres cadres. Les manuscrits doivent être d'au plus 2 000 mots, excluant le résumé et les références.

For more information contact Rebecca Hart, Managing Editor, at rhart@longwoods.com.

Organization and Dissemination of Working Knowledge

Organisation et dissémination des connaissances pratiques

by LESLIE L. ROOS, PHD
Manitoba Centre for Health Policy
Faculty of Medicine, University of Manitoba, Winnipeg, MB

LISA LIX, PHD
Manitoba Centre for Health Policy
Faculty of Medicine, University of Manitoba, Winnipeg, MB

RUTH BOND, MA
Manitoba Centre for Health Policy
Faculty of Medicine, University of Manitoba, Winnipeg, MB

STEPHANIE SMITH
Manitoba Centre for Health Policy
Faculty of Medicine, University of Manitoba, Winnipeg, MB

Abstract

This commentary discusses the approach taken by the Manitoba Centre for Health Policy to systematize its working knowledge. Web-based knowledge tools facilitate maintenance of the information-rich environments present in almost every province. The malleability of administrative data means that variables can be defined in many different ways. Keeping track of what has been done becomes critical to facilitate reuse. New social data sets pose particular challenges and opportunities. Some more general issues of design are highlighted by a perusal of websites associated with other research efforts (the Panel Study of Income Dynamics, the National Bureau of Economic Research and the Institute for Clinical and Evaluative Sciences).

Résumé

Ce commentaire traite de l'approche adoptée par le *Manitoba Centre for Health Policy* pour systématiser ses connaissances pratiques. Les outils de connaissance axés sur Internet facilitent le maintien des environnements riches en renseignements qu'on retrouve dans presque chaque province. La malléabilité des données administratives permet de définir les variables de nombreuses façons différentes. Il devient donc essentiel de suivre ce qui a été déjà fait afin d'en faciliter la réutilisation. Les nouveaux ensembles de données sociales posent des défis particuliers et offrent des occasions uniques. Certaines des questions plus générales liées à la conception deviennent évidentes lorsqu'on visite les sites Web consacrés à d'autres initiatives de recherche (le *Panel Study of Income Dynamics*, le *National Bureau of Economic Research* et l'*Institut de recherche en services de santé*).

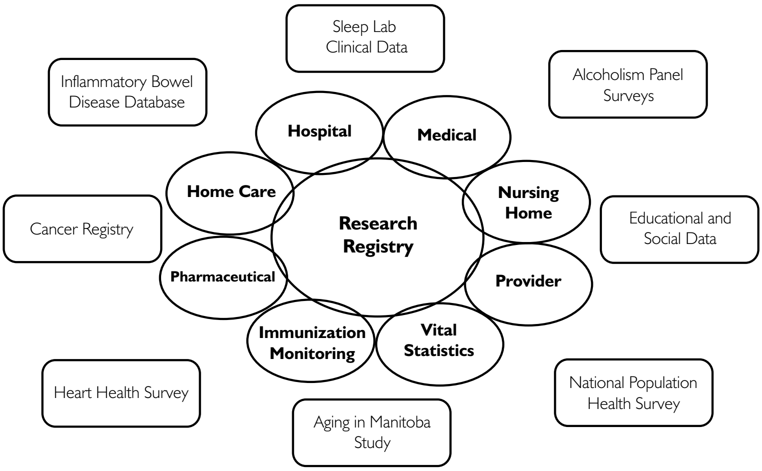
* * *

WEBSITES ARE CONSTANTLY INCORPORATING MORE AND MORE INFORmation; decisions related to organization are increasingly necessary. Here we describe the approach taken by the Manitoba Centre for Health Policy (MCHP) in systematizing its working knowledge, and also look at some general issues of website design. Sites are now being used for multiple purposes – by teachers and students, by researchers and consumers of research. What tips have emerged from our experience?

Web-based knowledge tools at MCHP have facilitated the development and ongoing maintenance of an environment rich in information (Figure 1). These tools have been used to document file structures and field names for the data sets that comprise the Manitoba Population Health Research Data Repository, to record conceptual and operational definitions and SAS codes for relevant research constructs and to capture critical steps in the implementation or plans for projects using repository data. Organizing new knowledge so that others can use it, and then passing such knowledge on to succeeding generations of researchers, is important for ensuring research productivity.

The malleability of administrative data represents both problem and opportunity. Since variables can be coded in many different ways, keeping track of what has been done and imposing order on the activities become critical for cost-efficient research. The MCHP's Documentation Management Group seeks to plan the Centre's

FIGURE 1. The Manitoba Health Research Data Repository*



*A similar version of this figure appeared in Roos et al. 2004.

approach to maintaining and updating the Web-based tools for knowledge documentation and management. With some additional effort, the material used for internal purposes can be organized for a wider audience.

The Manitoba Centre for Health Policy (2006) has structured its research resources in terms of:

a) Research Protocol – guide to conducting a new research study using administrative data at MCHP
b) Data Dictionaries – generally restricted to staff
c) Glossary and Related Terms – brief definitions of terms used and links to more detailed definitions
d) Concept Dictionary – extensive definitions of research concepts used by MCHP studies.

Documentation has also been developed on how to maintain the Glossary and Concept Dictionary on an ongoing basis. Such documentation for maintaining the Research Protocol and Data Dictionaries is planned.

Need for Details

Most of the provincial databases that are used for research across Canada do not contain as many files as does the Manitoba database. Nonetheless, several sites with which the authors are familiar would seem likely to benefit from the Research Protocol/Glossary/Concept Dictionary approach outlined above. For example, to the best of our knowledge, British Columbia handles length of hospital stay differently than Manitoba does. After a stay of 30 days, an individual in British Columbia is classified as a long-stay patient and a new abstract for the remainder of the stay is produced. In Manitoba, just one hospital separation abstract is generated no matter how long the length of stay.

The need for details is at least as great for those wishing access to Statistics Canada material. The Research Data Centres (jointly sponsored by Statistics Canada, the Social Sciences and Humanities Research Council and university consortia) can be expected to generate high levels of demand for "nitty-gritty" information about files. Statistics Canada's own staff would want such information well documented and organized for their own purposes.

Concepts

Documenting complicated material that might be reused (by the author or other investigators) is a priority addressed in the Manitoba Concept Dictionary. Key working knowledge is often too extensive to be published. Even if published in an academic paper (as text, table or appendix), such material might be difficult to find again. Relatively small amounts of text (100 or 200 words) seem to be reproducible from journals with acknowledgments on websites. At any rate, we have never had problems with journals or authors requesting changes or deletions to entries in the Concept Dictionary.

For example, the Concept Dictionary lists 12 "ambulatory care sensitive conditions" which, although traditionally defined by four- or five-digit (ICD-9-CM) codes on hospital discharge abstracts, can be closely approximated by the three-digit codes on Manitoba physician claims. Our research appears to have been the first population-based study using both physician and hospital data; the results suggested that avoiding hospitalization through "good" ambulatory care for these conditions is much more difficult than previously thought (Roos et al. 2005).

More generally, not only have diagnostic codes for certain conditions not been standardized, but journals have not insisted on structured presentation of certain facts about research (ICD codes, loss to follow-up, etc.). A review by Guyatt et al. (2006) comparing American and Canadian surgical outcomes highlighted this for the senior author. Although referenced in published papers, information that was important for assessment of the quality of the author's own work was not easily available to the abstractors performing their literature review. Since different journals have markedly different audiences and styles, a central, Web-located listing that addresses issues of quality, such as follow-up, is useful for any research group.

Who Does What

Who is to develop and maintain the content of such "working knowledge"? Because brief Glossary entries have been made part of the Manitoba Centre's deliverables, their write-up is part of the lead investigator's responsibilities. The Concept Dictionary and Research Protocol need staff assigned with specific responsibilities for such work. Even the Glossary needs frequent attention to coordinate entries across deliverables.

How should decisions be made about what is to be included and what not? One driver has been requests ("frequently asked questions") for more or clearer information by staff, by collaborators outside Manitoba and by external reviewers. As some of our efforts have expanded from health research to social research, new complicated variables (such as indices of educational achievement) and more work with the research registry (specification of family structure) have had to be explained in considerable detail.

New Health and Social Data Sets

Large data sets specifically collected for research purposes – particularly long-term efforts like the University of Michigan's (2006) Panel Study in Income Dynamics (PSID) – will have a structure imposed upon them. In contrast, administrative data will usually need to be carefully organized after the fact. Each new healthcare data set has its own idiosyncrasies and problems. Data from provincial ministries dealing with social issues seem even more complicated and more likely to vary over time than the healthcare data sets. Provincial health ministries have been relatively constrained by efforts (such as ICD coding) to establish national and international credibility.

Researchers using social data sets will often have questions about the populations served that are largely not asked for health data sets (given Canada's national health insurance). The possibilities for following children throughout their educational careers are intriguing, but test and grade data may be uneven or unavailable for other than recent years. In the most practical terms, descriptions of data sets, including their strengths and weaknesses, are generally helpful for both actual research and proposal writing. Warburton and Warburton (2004) have highlighted the desirability of making provincial administrative data sets on welfare dependency and education available for research. If progress were to be made along these lines, reference to a publicly accessible website would help provide information to interested academics, administrators and reviewers.

Organizing Websites

Work on our Manitoba website and perusal of other sites has generated suggestions for improvement.

1. *Structure output (papers and reports) by topic.* Although PubMed, ISI (Institute of Scientific Information) and Google Scholar searches will find material on a variety of topics, additional organization remains useful for a number of purposes. The Panel Study of Income Dynamics has categorized papers relying on this complex data set simply but effectively. The National Bureau of Economic Research (NBER Working Papers) and the Institute for Clinical and Evaluative Sciences (ICES) have catalogued their output by subject. Data being used across disciplines may particularly benefit from such attention; PubMed is likely to miss material not published in health-related journals.
2. *Locate a navigation bar at the top of every page.* Some of this has been done for the MCHP website, but the navigator bar is not as ubiquitous as that at the PSID site.
3. *Develop a site guide that displays all pages* that can be accessed at a given site.

Correspondence may be directed to: Leslie L. Roos, Manitoba Centre for Health Policy, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba, Rm. 408 – 727 McDermot Avenue, Winnipeg, MB R3E 3P5; tel.: 204-789-3773; fax: 204-789-3910; email: Leslie_Roos@cpe.umanitoba.ca.

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Dès son apparition, le web s'est imposé comme un instrument à la fois de transfert et de diffusion des connaissances, mais il n'en demeure pas moins un outil relativement nouveau, qui ne cesse d'évoluer au fur et à mesure que de nouvelles technologies voient le jour. Les rédacteurs veulent savoir comment votre organisme vit le transfert des connaissances par le web : ce qui fonctionne, ce qui ne fonctionne pas et comment vous vous en rendez compte?

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RESEARCH PAPER

The Research Collective: A Tool for Producing Timely, Context-linked Research Syntheses

Le collectif de recherche : un outil pour produire des synthèses de recherche en temps opportun et liées au contexte

by RAYNALD PINEAULT, MD, PHD
Direction de santé publique de Montréal
Institut national de santé publique du Québec
Université de Montréal, QC

PIERRE TOUSIGNANT, MD, MSC
Direction de santé publique de Montréal
Institut national de santé publique du Québec
McGill University, QC

DANIÈLE ROBERGE, PHD
Centre de recherche Hôpital Charles-LeMoyne
Université de Sherbrooke, QC

PAUL LAMARCHE, PHD
Groupe de recherche interdisciplinaire en santé
Université de Montréal, QC

The Research Collective: A Tool for Producing Timely, Context-linked Research Syntheses

DANIEL REINHARZ, MD, PHD
Département de médecine sociale et préventive
Université Laval, Québec, QC

DANIELLE LAROUCHE, MSC
Centre de recherche Hôpital Charles-LeMoyne
Université de Montréal, QC

GINETTE BEAULNE, BSC, PNP
Direction de santé publique de Montréal
Institut national de santé publique du Québec
Montreal, QC

DOMINIQUE LESAGE, RN, MSC
Institut national de santé publique du Québec
Montreal, QC

Abstract

This paper reports on a research collective in primary healthcare (PHC) conducted in Quebec in 2004. A lead team of investigators synthesized 30 ongoing or recently completed studies from project description forms filled out by the participating researchers.

The process of the collective is examined by addressing the three main challenges met in the course of its completion, namely, (a) the need to derive an analytical framework to regroup variables in a meaningful way, (b) the assessment of strength of evidence and (c) coping with a mix of quantitative and qualitative studies. Advantages of the collective over other forms of research synthesis include timeliness, low cost relative to the total cost of the studies it comprises and the information it generates and, finally, context linkage, which enhances relevance but which could limit transferability of the findings. Overall, the research collective appears to be a promising tool for research synthesis.

Résumé

Cet article rapporte l'expérience d'un collectif de recherche sur les services de santé de première ligne menée au Québec en 2004. Trente études en cours, ou récemment terminées, ont fait l'objet d'une synthèse conduite par une équipe d'investigateurs à partir d'une fiche de description des projets complétée par les chercheurs participant au collectif.

Le processus du collectif est analysé en examinant les trois principaux défis rencontrés dans sa réalisation, soit (a) la nécessité d'élaborer un cadre d'analyses, afin de regrouper les variables d'une manière logique, (b) l'appréciation de la force de la preuve scientifique et (c) la façon de procéder lorsqu'on a des données quantitatives et qualitatives. Les avantages découlant du collectif, comparativement à d'autres formes de synthèses de recherche sont discutés, notamment son caractère contemporain, son coût marginal au regard du coût total des études retenues et de l'information produite et, enfin, le contexte, qui rehausse la pertinence mais pourrait limiter la transférabilité des résultats. Dans l'ensemble, le collectif de recherche semble être un outil prometteur pour produire des synthèses de recherche.

Financial resources devoted to research, and more particularly to health services and policy research, have increased considerably in recent years (CIHR 2004a). Funding agencies expect that such research will help policy makers and managers solve the numerous problems faced by our healthcare system (CIHR 2004b; Lomas 2000). Yet, most of the time, research findings are produced and disseminated one project at a time, and links with other ongoing projects dealing with similar subjects are not generally made. Since research findings take many years to appear in the published literature, decision-makers often disregard or distrust them because they are seen as outdated (Innvaer et al. 2002; Lavis et al. 2005). To be useful to decision-making, research findings need to be produced, synthesized and disseminated more rapidly (Sheldon 2005; Lavis et al. 2005).

The need for timely synthesis of research findings seems difficult to satisfy using traditional methods (Innvaer et al. 2002; Lavis et al. 2005). The research collective offers an alternative approach that is designed to meet this need (Pineault and Tousignant 2001).

Although both a research collective and a systematic review of the literature can produce a synthesis, a research collective differs from a systematic review of the literature in several respects:

- it involves active participation of the researchers whose studies are selected;
- it also involves the participation of decision-makers, as their viewpoints are considered in the analysis;
- its findings are timely, based on ongoing or recently completed research, and are rapidly released;
- it is context linked, that is, the studies upon which it rests come from well-identified contexts that increase the collective's usefulness and pertinence for decision-makers operating under comparable conditions.

The research collective can thus be defined as a process of dynamic exchange between a group of researchers and a lead team of investigators, resulting in the research synthesis of a limited number of projects on a given subject. In a general sense, the term *research synthesis* refers to the overall process of gathering and synthesizing data from different sources; in this sense, a research collective, like a systematic review of the literature, can be viewed as a particular form of research synthesis. Alternatively, in a stricter sense, research synthesis represents one stage in the overall process of a systematic review or of a research collective (Mays et al. 2005).

The objective of this paper is to present the approach, process and methods followed in a research collective on primary healthcare (PHC) conducted in Quebec in 2004 and to discuss the main advantages and challenges arising from this experience (Pineault et al. 2005).

The choice of PHC as a focus for the collective was based on several considerations. First, major problems in healthcare systems have been identified in relation to continuity, accessibility and comprehensiveness, and these phenomena are closely related to PHC (Romanow 2002; Wilson et al. 2004). Second, the central role played by PHC in healthcare systems has been underscored by several authors, based on empirical evidence (Starfield 1998; Macinko et al. 2003). Finally, reforms have been initiated to address these issues (Showstack et al. 2004). It is thus important to inform decision-makers about the elements of PHC that seem to be most promising for achieving the expected results.

Overview of Methods

The research collective was led by a group of investigators who worked on the synthesis and prepared the report. Initially, a list of Quebec researchers whose work focused on the organization of healthcare services was drawn from different sources (research agencies, universities, research centres and groups). These researchers were asked to submit research projects that would meet the terms of reference of a research collective on the organization of PHC. More than 90 submissions were received.

To be selected, a research project had to:

1. focus on PHC services in the broadest sense (projects dealing only with hospitals or long-term care facilities were excluded);
2. examine healthcare services (projects restricted to social or community services were excluded) and, more specifically, the organization of PHC services;
3. be recent, that is, still underway or completed within the last three years; and
4. have results to present.

Thirty projects, listed in Appendix 1, satisfied these criteria. Researchers from the 30 projects participated in different steps of the research collective. The high participation rate throughout the collective can presumably be explained by two factors: (a) among the investigators were respected senior researchers and academics who knew and shared the values inherent to the research culture and (b) the researchers were informed from the start that their papers would be published in the collective as "chapters in a book," and that their contributions would be recognized and valued as concrete accomplishments in terms of knowledge exchange activities.

For each project, the researchers were required to fill out a project description form that investigators and researchers agreed upon at a first meeting held in April 2004. The form specified the information to transmit regarding research questions, study objectives, methodology and findings (Pineault et al. 2005).

The researchers briefly presented their projects during a seminar held in June 2004. A group of decision-makers representing different constituencies (ministry of health, regional agencies, public health, PHC organizations) also attended this meeting and were asked to react to and comment on the projects. Visual aids used by researchers in their presentations, as well as notes taken during discussions with decision-makers, were gathered and retained as material to be analyzed and incorporated into the final report. After the meeting, researchers were asked to revise the project description forms they initially completed in the light of other researchers' presentations and the discussions. They were asked to pay particular attention to links among the projects.

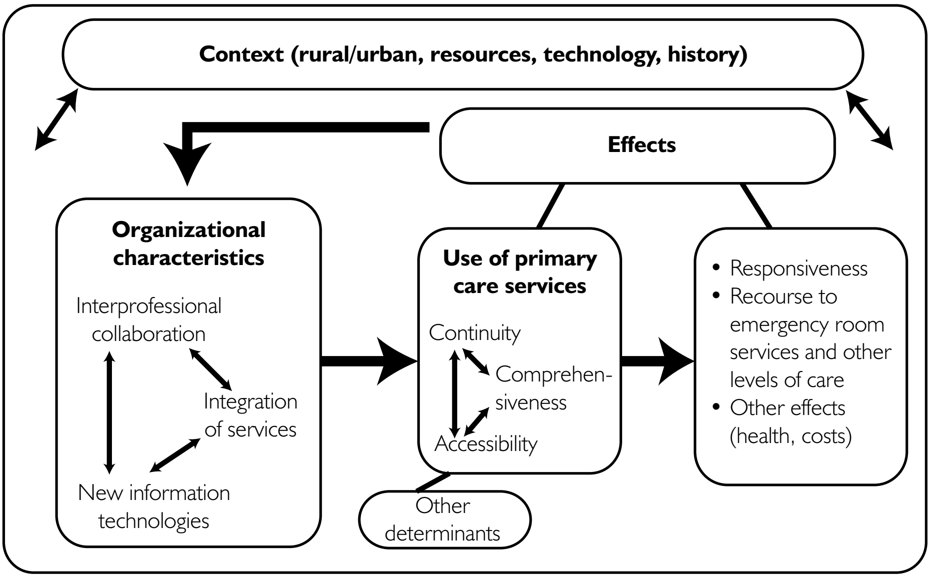
Investigators' initial examination of the 30 project description forms identified several recurring themes dealing with concepts and phenomena that are especially relevant to ongoing reflections on PHC services, specifically: integration of services; interprofessional collaboration; new information and communication technologies; and dimensions of service utilization (continuity, accessibility and comprehensiveness) and their effects on recourse to emergency room (ER) services, responsiveness, health and costs. Investigators cross-referenced the projects to produce a first draft of the synthesis, which was sent to researchers for validation.

Researchers' suggestions and corrections were integrated into the final version of the report, which was released at a knowledge exchange meeting on February 3, 2005. Half the 100 participants at the meeting were decision-makers.

Challenges and Issues

The synthesis findings are available elsewhere (Pineault et al. 2005). This paper focuses on the main challenges faced and on the issues raised in the process of conducting the collective.

FIGURE 1. Analytical framework: contextual blocks



Deriving an analytical framework

The first challenge was the necessity to derive an analytical framework in order to regroup the variables in a meaningful way. This analytical framework emerged from the investigators' thematic reading of the project description forms (Figure 1).

Following a configurational approach, which sees organizations in terms of constellations of attributes rather than individual characteristics, the investigators examined the variables, by block rather than individually, because variables were found to be closely interrelated within each block (Meyer et al. 1993). For instance, integration of services and interprofessional collaboration were found to be core elements of integrated healthcare networks, and new communication and information technologies, when implemented, supported integration. Similarly, continuity, accessibility and comprehensiveness were three interdependent dimensions of service provision/utilization that very often overlapped in the studies. Consequently, they were deemed more meaningful when examined together. Finally, the block of consequences, such as responsiveness and use of ER, clearly constituted a conceptually distinct category. These three blocks of variables are shaped and influenced by such contextual elements as geographic characteristics (rural/urban), level and type of resources, availability of technology and so on. Theories and concepts referred to in individual studies were implicitly put together to elaborate a sort of meta-theory underlying the analytical framework (Pawson et al. 2005; Dixon-Woods et al. 2005). Examining the 30 studies together within this analytical framework made it possible to clarify the links among integrated services, interprofessional collaboration, new communication and information technologies and indicators of utilization and outcome.

Assessing strength of evidence

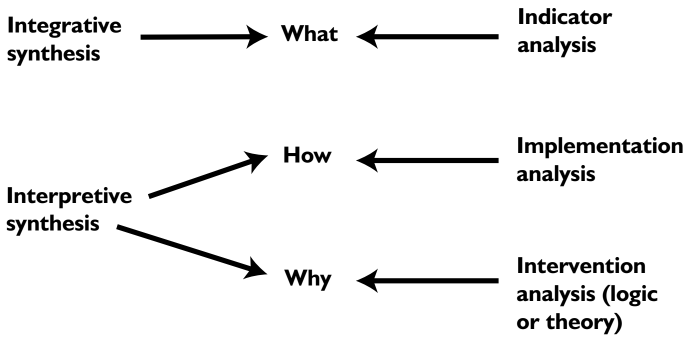
The second challenge was assessing the strength of evidence of the findings. The investigators did not formally assess the scientific quality of the studies for two reasons. First, the projects had been funded by research granting agencies and, hence, had successfully passed the test of scientific merit. Second, the researchers might have been reluctant to participate had they known that investigators would evaluate the strength of their study methodologies.

In the synthesis, however, the investigators considered certain factors in weighing their conclusions, namely, the number of studies associated with specific results and their convergence or divergence. Furthermore, the investigators' judgments and conclusions always referred to the supporting studies, and thus validity could be checked in all cases. It must be added that in filling out project description forms, the researchers were asked to assess the validity of their own research. Internal validity/credibility and external validity/transferability were assessed by filling out the grids shown in Appendix 2. Note that the term *internal validity* (used in quantitative studies) is coupled with the term *credibility* (used in qualitative studies), while the term *external validity* (used in quantitative studies) is paired with *transferability* (its counterpart in qualitative studies). Both quantitative and qualitative criteria were considered. For example, research design, sample size, size of reference population and statistical inference all refer to quantitative criteria, whereas intervention and implementation analyses refer more specifically to qualitative criteria (Devers 1999). It is interesting to note that the researchers' assessment of their own studies showed high variability and revealed an acute sense of critical judgment. For example, concerning internal validity/credibility, 20% of the researchers rated their research "low" on a three-point ordinal scale, whereas 37% rated it "high." Likewise, 20% of the researchers rated their research "low" on the scale of external validity/transferability and 30% rated it high.

Similarly, continuity, accessibility and comprehensiveness were three interdependent dimensions of service provision/utilization that very often overlapped in the studies. Consequently, they were deemed more meaningful when examined together.

The investigators did not take researchers' self-assessment of the methodological value of their research into formal account. They applied implicit rather than explicit criteria, in the same manner as expert judgment on quality of care most often rests on implicit criteria of what constitutes good medical care (Donabedian 1980). The investigators went through implicit yet reproducible steps to produce the research synthesis. This approach is more in line with Patton's (1999) view that the confidence placed by decision-makers on research findings is mainly based on the credibility of researchers/investigators, which, in turn, depends on their perceived competence, integrity and judgment.

FIGURE 2. Complementary use of integrative and interpretive approaches in the synthesis

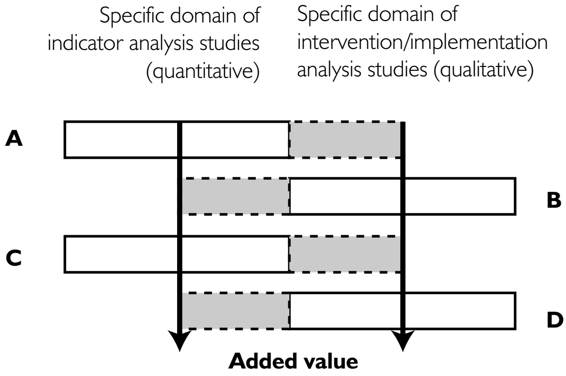


Mixing qualitative and quantitative studies

As is the case for most syntheses in healthcare, a third challenge was mixing qualitative and quantitative studies in the same synthesis (Dixon-Woods et al. 2005; Mays et al. 2005). Of the 30 studies, 18 were qualitative and 12 quantitative. The quantitative studies focused more on measures of utilization and outcomes, whereas the qualitative ones focused more on organizational modes (e.g., integration of health services and interprofessional collaboration). The quantitative studies addressed the question of what works, whereas the qualitative ones addressed, to a greater extent, the questions of how and why it works (Dixon-Woods et al. 2005; Mays et al. 2005).

Both types of studies refer to different theoretical and methodological perspectives: quantitative studies rest upon indicator and statistical analyses, whereas qualitative studies rest upon intervention and implementation analyses (Figure 2). The quantitative approach addresses the "what" question and is more amenable to integrative synthe-

FIGURE 3. Value added in synthesizing integrative (quantitative) and interpretative (qualitative) approaches



sis that combines, aggregates and summarizes data. The qualitative approach addresses the "how" and "why" questions and is better suited for interpretive synthesis in which interpretation of data and inductive judgments are formulated on the basis of concepts and theory emerging in the course of the synthetic analysis (Dixon-Woods et al. 2005).

Mixing integrative and interpretive approaches in the synthesis clearly yielded added value, as illustrated in Figure 3, which shows four hypothetical studies, two quantitative (A and C) and two qualitative (B and D). Through a re-analysis of the indicator studies, it was possible to seek qualitative elements related to intervention or implementation analysis but not initially identified by the researchers, and thus to extend them into the domain of qualitative studies. Similarly, it was possible to move qualitative implementation/intervention studies into the domain of indicator studies by paying more attention to the analysis of indicators, which was not the focus of the original studies. The net gain, as shown in Figure 3, is represented by the shaded portions of the bars. In this sense, our approach draws upon both thematic analysis and narrative synthesis (Mays et al. 2005).

Discussion

Compared to more traditional syntheses, the collective appears to yield significant benefits. At the same time, it raises some problems that need to be addressed.

Benefits

The first advantage of the collective is its timeliness, since it reports on studies that are either underway or were recently concluded – a clear advantage over systematic reviews based on published material. Adding to the timely character of the collective is its rapid completion. Our synthesis took eight months to complete.

The collective thus appears to be an efficient way of synthesizing research findings. Not counting researchers' and investigators' time, the cost of this collective was about $125,000. Of this amount, $44,000 came from cash contributions from research funding agencies and $61,000 represented contributions in kind from the host institutions. We estimated $150,000 to be the average cost of each of the 30 research projects, for a total of $4.5 million.Thus, the cost of the collective represents a small proportion of the total cost of the projects. This small incremental cost should encourage research funding agencies to support such syntheses on a larger scale.

Among the main benefits of the collective are the opportunities created for exchanges among researchers, investigators and decision-makers.

An assessment of the return on investment from research collectives could be refined by coupling cost figures to utilization of the information generated by the synthesis. For example, a survey done among users of this information would enable us to determine the type of use decision-makers have made of the synthesized findings: symbolic, conceptual or instrumental (Denis et al. 2004; Huberman 1994). Such a survey has already been commissioned by the Canadian Health Services Research Foundation (CHSRF) in the case of one policy synthesis (Lamarche et al. 2003). We intend to follow the same approach and evaluate the extent and type of use by decision-makers of the information generated by the collective one year after its release.

Among the main benefits of the collective are the opportunities created for exchanges among researchers, investigators and decision-makers. Direct participation of decision-makers in the early stages of the synthesis was an effective way to formalize personal contact between researchers and decision-makers and ensure that the latter applied the results (Innvaer et al. 2002).

Direct involvement of researchers also distinguishes the collective from traditional systematic reviews. Through their active involvement, researchers were able to provide specific data well adapted to the terms of reference specified by investigators, and to tailor these to the project descriptions. Flexibility and adaptation, as experienced in the collective, are not generally possible in a systematic review.

Exchange among researchers working within a shared domain is worthwhile in itself. It enables researchers to broaden their perspective through becoming informed about their colleagues' projects and exchanging theoretical, methodological and applied aspects of their work. Such access is rare: owing to the mechanisms of project funding in research, researchers within a same group or centre are often unaware of their colleagues' research, even on subjects of common interest.

Although participating in the collective demanded a considerable investment of time from researchers (who were required to attend three meetings, complete a first and then a revised draft of the project description form and then review the final draft of the synthesis), nevertheless, their evaluation feedback indicates that they appreciated the exercise, particularly their discussions with researcher colleagues and their interactions with decision-makers. These researchers considered the publication of their work in the detailed report of the collective and their inclusion in a knowledge exchange activity with decision-makers to be valuable steps in advancing their academic and research careers.

Finally, the fact that the collective is linked and limited to a given context yields greater in-depth analysis of the context and its interacting components, consequently leading to a better understanding of the contextual environment. In that sense, the collective produces context-sensitive evidence (Lomas et al. 2005). From the standpoint of strict statistical inference, limitation to a single context could reduce external validity/transferability of the results. However, through implementation analysis, transferability of the findings can be ensured by identifying the conditions under which these results are produced. Organizational studies have shown that case studies can be generalized well beyond the case being studied (Yin 1999).

Limitations

The process of the collective had limitations that need to be considered. In the context of evidence-based decision-making, the greatest and most obvious problem with a collective is assessment of the strength of evidence of the findings. As mentioned earlier, the researchers rated their own projects for both internal validity/credibility and external validity/transferability using both quantitative and qualitative criteria. Although investigators did not use this assessment in their synthesis, it seems an interesting avenue to pursue. Indeed, the researchers were critical of their research, as reflected in their self-assessment scores.

Another potential problem is the proximity of researchers and investigators, since all come from a small community. Moreover, the investigators participated as researchers in 11 of the 30 studies. In synthesizing, there is always the risk of investigator bias and lack of objectivity regarding participants' own projects. Measures were taken to prevent this, namely, by having investigators check one another's projects and critically revise successive versions of the synthesis. On the other hand, the proximity of researchers and investigators could also be seen as an advantage, since investigators have a better knowledge of the literature dealing with the study topics and of the context in which studies take place. This better understanding of the healthcare system facilitates in-depth and critical analysis of the studies under review.

By definition, the collective was limited to existing, ongoing or recently completed projects. While this limitation ensures the collective's timeliness, it can also be viewed as a drawback. The synthesis report does not refer to the literature dealing with the organization of PHC services. Ideally, it would be advantageous to interpret and discuss the findings of collectives in light of systematic literature reviews of similar topics. However, adding a systematic review to the process would lengthen the duration of the collective's work and the project's cost. Alternatively, the role played by the content experts among the investigators could obviate the need for complementary systematic reviews while preserving timeliness.

Because of its timely character, the collective runs the risk of disseminating preliminary data that further analysis will reveal to be invalid or, at least, slightly different. The synthesis report included cautionary remarks addressing this point. This risk has to be weighed against the increased degree of certainty that the findings, though preliminary, can bring to decision- and policy making. Ultimately, decision-makers themselves should determine whether the usefulness of the findings outweighs the risk inherent in preliminary data. In the case of this collective, decision-makers participating in the meetings clearly indicated their acceptance of the risk and their high regard for the collective's usefulness.

Conclusion

The collective appears to be a promising tool for research synthesis. The main advantages are its timeliness, its context linkage and the participatory exchange it generates among researchers, investigators and decision-makers. It thus meets many conditions that have been associated with the application of research findings by decision-makers (Innvaer et al. 2002; Lavis et al. 2005). Limitations can also be identified from this experience and must be addressed to improve the tool. Among them is the need to better assess strength of evidence, especially when based on self-assessment by researchers, in order to produce evidence synthesis rather than research synthesis only. Likewise, to strengthen evidence, the collective's findings could be triangulated with those stemming from systematic reviews of the literature. Finally, special attention should be devoted to enhancing participation of both researchers and decision-makers in the process. Overall, researchers' experience of participation was positive but could still be improved by establishing a more open and continuous forum of exchange with investigators. As for decision-makers, their participation is also important, and methods must be developed to consider, analyze and integrate their viewpoints into the broader context of a deliberative process leading to more enlightened decision- and policy making.

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Correspondence may be directed to: Raynald Pineault, MD, PhD, Direction de santé publique de Montréal, 1301 Sherbrooke E., Montreal, QC H2L 1M3; tel.: 514-528-2400, ext. 3480; fax: 514-528-2512; email: rpineaul@santepub-mtl.qc.ca.

Appendix 1: List of the 30 Projects

1. J. Afilalo, A. Marinovich, M. Afilalo, A. Colacone, R. Léger, B. Unger. Characteristics of non-urgent patients who go to emergency services and obstacles to primary care services
2. A. Battaglini, P. Tousignant, L.-R. Poirier, M. Désy, H. Camirand. Matching primary care social and health services to the needs of immigrant populations: Impact of multiethnicity on the organization and delivery of services
3. M. Demers. Primary care services in Québec in 2000: Organization, utilization and changes in general practice
4. N. Leduc, J. Ricard, L. Farand, D. Roberge, A.A. Gbaya. The outpatient services centre as an alternative to hospital emergency services
5. N. Leduc, F. Champagne, S. Bergeron, M. Lafrance, G. Ste-Marie. Study of recourse to emergency paediatric services as a substitute for primary care services
6. L.-R. Poirier, R. Pineault, D. Ouellet, J. Gratton. The reorganization of Montreal's health services network: Long-term impact
7. C. Wolfson, L. Lévesque, H. Bergman, F. Béland, L. Trahan, A. Perrault. Longitudinal study of the unfulfilled needs for assistance and community services among individuals 75 years of age or over
8. M. Clément, D. Aubé, C. Beaucage, M. Tremblay. The continuity of care among individuals affected by the dual disorders of mental illness and drug addiction: Users' responsibility and organizational perspective
9. R. Geneau, R. Pineault, P. Lamarche, P. Lehoux. The structuration process of general practitioners' primary care practice: A qualitative study on the constraining and enabling properties of organizational modes

10. J. Haggerty, R. Pineault, M.-D. Beaulieu, Y. Brunelle, F. Goulet, J. Rodrigue, J. Gauthier (main project); J. Haggerty, D. Roberge, R. Pineault, D. Larouche, N. Touati (hospital emergency services project). The impact of the organization of primary care medical services on accessibility and continuity: Factors associated with differences in the use of hospital emergency services in rural and urban areas
11. R. Ionescu-Ittu, J. McCusker, N. Dendukuri. Continuity of primary care and return visits to emergency departments (ED) based on administrative data
12. J. McCusker, J. Verdon, P. Tousignant, L. Poulin de Courval, N. Dendukuri, P. Jacobs, E. Latimer. Rapid two-stage emergency department (ED) intervention for seniors: Impact on continuity of care
13. L.R. Poirier, M. Caulet, L. Fournier, C. Mercier, A. Lesage, D. White. The impact of service integration on maintenance in the community of individuals affected by major psychiatric disorders who have just experienced a crisis situation
14. A.-P. Contandriopoulos, M.-A. Fournier, C. Dassa, R. Latour, F. Champagne, H. Bilodeau, N. Leduc. Practice profiles of Québec general practitioners
15. M.-D. Beaulieu, J.-L. Denis, D. D'Amour, J. Goudreault, L. Lamothe, G. Jobin, J. Haggerty, É. Hudon, R. Geneau, R. Pineault, R. Lebeau. The implementation of family medicine groups: The challenge posed by the reorganization of practice and interprofessional collaboration
16. D. D'Amour, L. Goulet, R. Pineault, J.-F. Labadie. The effect of interorganizational collaboration on perinatal services, health and responsiveness
17. J.-P. Fortin, L. Lamothe. Quebec networked computerized file in oncology (DRIOQ)
18. A. Guttman, M. Afilalo, R. Guttman, A. Colacone, C. Robitaille, E. Lang, S. Rosenthal. An emergency department–based nurse discharge coordinator for elderly patients: Does it make a difference?
19. E. Lang, M. Afilalo, J.F. Boivin, R. Léger, A. Colacone, X. Xue, A. Vandal, S. Rosenthal, B. Unger. An Internet-based standardized communication system (SCS) linking the emergency department with primary care physicians (PCPs): A randomized clinical trial measuring continuity of care
20. A. Tourigny, L. Bonin, D. Morin, M. Buteau, L. Mathieu, L. Robichaud, A. Vézina, P.-J. Durand, R. Hébert. Interdisciplinary, interestablishment geronto–geriatric information system: Perceived usefulness and use in real time
21. L. Trahan, M. Demers, R. Geneau, H. Guay, M. Bowen, J. Tremblay. Evaluation of family medicine groups
22. F. Béland, H. Bergman, P. Lebel, A.-P. Contandriopoulos, J.-L. Denis, P. Tousignant, J. Monette, F. Ducharme. System of integrated care for the frail elderly (SIPA): Evaluation of phase I, June 1999 to May 2000
23. J.-L. Denis, A.-P. Contandriopoulos, C. Sicotte, N. Touati, C. Rodriguez, H. Nguyen. Evaluation of the Capitation Haut-Saint-Laurent project: An integrated

care and services network

24. M.-J. Fleury, A. Lesage, C. Mercier, M. Perreault, D. Aubé and L.-R. Poirier. Integrated service networks and response to the needs of individuals affected by acute mental health disorders
25. M.-J. Fleury, C. Mercier, J. Caron. The integration of mental health services: Comparison of the propensity of different strategies to integrate services in mental health networks
26. M.-J. Fleury, L. Cazale, M. Perreault. Evaluation protocol respecting the mental health service network demonstration project in the territory of the Centre local de services communautaires (CLSC) Longueuil-Ouest
27. J.-P. Fortin, L. Lamothe. The CLSC of the future: Home support and tele-care
28. P.-A. Lamarche, L. Lamothe, C. Bégin. Effects of emerging modes of integration of services in the Laurentian region, Quebec
29. P.-A. Lamarche, L. Lamothe, M. St-Pierre. Concerted action in a territory project (PACTE): Local management of services in the health and social services network in response to the needs of the elderly
30. A. Tourigny, P.-J. Durand, A. Tourigny, L. Bonin, R. Hébert, M. Paradis. Evaluation of the efficacy of an integrated service network for vulnerable elderly people in a semi-urban territory

Appendix 2: Self-Assessment Grids

Assessment of internal validity/credibility by researchers

	LITTLE	SOMEWHAT	VERY MUCH	NOT APPLICABLE
How confident are you about the strength of the relationship among your variables based notably on:				
• Research design				
• Sample size (statistical power)				

• Intervention analysis (logic/theory of intervention)				
• Implementation analysis (synergy, antagonism with contextual elements)				
• Other:				

Assessment of external validity/transferability by researchers

	LITTLE	SOMEWHAT	VERY MUCH	NOT APPLICABLE
How easily can your results be applied in other contexts based notably on:				
• Size of reference population, diversity of studied cases				
• Statistical inference (inference from sample to study population)				
• Implementation analysis (can implementation conditions be found in other contexts, or be replicated)				
• Intervention analysis (theoretical inference stemming from the fact that the studied intervention is based on an explicit intervention theory that can be applied in other contexts)				
• Other:				

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COMMENTARY

The Research Collective: A Model for Developing Timely, Contextually Relevant and Dynamic Approaches to Research Synthesis?

Le collectif de recherche : un modèle pour élaborer, en temps opportun, des synthèses de recherche dynamiques et liées au contexte?

by CHARLYN BLACK, MD, ScD
Director, Centre for Health Services and Policy Research
Professor, Department of Health Care and Epidemiology
University of British Columbia
Vancouver, BC

Abstract

In this issue, Pineault and colleagues (2006) report on a Quebec-based research collective, a process aimed at rapidly synthesizing results from ongoing or recently completed research and releasing them to decision-makers.

The process outlined differs markedly from Cochrane-based formal systematic reviews, and the authors claim a number of benefits that make the results more relevant to decision-makers, including enhanced timeliness of results, increased triangulation among emerging research findings, and more in-depth understanding of the impact of contextual environments on research results.

This approach may offer opportunities to both advance and enrich existing synthesis tools. The research community should learn more from this process.

Résumé

Dans ce numéro, Pineault et ses collègues (2006) font un rapport d'un *collectif de recherche* menée au Québec, processus destiné à produire une synthèse rapide des résultats de recherches en cours ou récemment terminées et à fournir cette synthèse aux décideurs.

Le processus du collectif de recherche est très différent des revues systématiques en bonne et due forme de Cochrane, et les auteurs affirment qu'un certain nombre d'avantages rendent les résultats plus pertinents à la prise de décisions, notamment : des résultats disponibles en temps opportun, une mise en rapport plus marquée des tendances ressortant des résultats et une compréhension approfondie de l'effet des contextes sur les résultats des recherches.

Cette approche pourrait permettre à la fois de progresser et d'améliorer les instruments de synthèse déjà à notre disposition, et le monde de la recherche devrait trouver ce processus enrichissant.

◆

FOLLOWING ON A SERIES OF ARTICLES AND COMMENTARIES THAT HAVE FEAtured prominently in these pages about the role and nature of research synthesis, this issue of *Healthcare Policy* features an article by Pineault and colleagues describing a dynamic and interactive approach to the synthesis of ongoing and recently completed research. The authors report on a Quebec-based research collective in the area of primary healthcare (PHC) in which a lead team of investigators worked with researchers to synthesize 30 ongoing or recently completed studies to produce "timely, context-linked research syntheses" within a summary report. The synthesis process focused on determining how, and to what extent, different modes of organizing primary care services can affect service delivery, and on understanding change processes that would facilitate the implementation of effective primary care practices in different contexts. The process involved active participation by researchers, development of a conceptual/analytic model, consultation with decision-makers and development of a report that highlighted seven key messages targeted at the decision-making community (Pineault et al. 2005).

What was different about this process? The focus was on synthesizing results from locally conducted research that was either underway or had recently been completed but was unpublished, and the aim was to release results rapidly. The process involved active and ongoing participation of local researchers; it also involved participation of decision-makers, although this aspect is less well described. Finally, the process sought to link research to the context in which it was conducted, to involve researchers in considering their findings in light of other research, and to work collectively to develop a more comprehensive and contextually based understanding of their individual work within a broader framework.

This process stands in stark contrast to the Cochrane approach of developing formal, systematic reviews of published research (see, for example, Lavis et al. 2006). First, there was no specific question, no explicit definition of a search strategy and no explicit statement about the types of research evidence that were to be included and excluded. Instead, the focus was broadly defined in terms of content area alone: researchers (presumably within Quebec) whose work focused on the organization of healthcare services were identified and invited to submit information about research projects that were related to the organization of PHC services. More than 90 projects were identified; of these, 30 projects satisfied a set of criteria and were selected for the synthesis. Based on review of the eligible studies, investigators developed an analytic framework and worked with researchers and decision-makers to synthesize results. The resulting synthesis included qualitative and quantitative studies and supported consideration of a broad range of questions and issues.

Another significant contrast with the Cochrane review process related to the lack of formal assessment of scientific quality of the studies. While a process was developed to seek researchers' assessment of the validity of their own studies (and many were fairly self-critical), there was no validation of their interpretations. Finally, in contrast to Cochrane processes, there was not a transparent process of interpretation of the findings of studies in the review. Instead, investigators and researchers worked collaboratively to develop the project description form; projects were presented at a seminar attended by decision-makers; and revision of project descriptions was undertaken by researchers in response to feedback and understanding gained from familiarity with other projects. From this point, the lead investigators classified projects, produced a first draft of a synthesis report, and sent it to researchers for validation. Researchers' suggestions and corrections were incorporated into the final version of the report. The process, therefore, was unique in a number of ways: it focused on reviewing unpublished research and producing timely dissemination of results; it adapted the synthesis to maximize local applicability; it involved active partnerships with researchers, and to some extent with decision-makers; and it used a flexible and evolving approach both to frame the questions and content areas to be addressed, as well as to conduct the overall synthesis. The result is a textured set of messages targeted at decision-makers.

Pineault et al. suggest a number of benefits to the process they undertook, including timeliness of results; the relatively low cost of producing synthesis results relative to the cost of producing the primary research studies; opportunities for exchanges among researchers, which led to familiarity with other projects and greater perspective on theoretical, methodological and applied aspects of the work; and support for more in-depth analysis of the contextual environment in which studies were conducted. The authors claim that these aspects make the synthesis more relevant to decision-makers. They also identify a number of limitations of the approach, including potential for bias related to the interaction between researchers and investigators, the risk of disseminating preliminary and invalid findings and the limited generalizability of results.

The research collective model may therefore provide opportunities for more intensive and collaborative involvement of researchers in developing knowledge translation skills and products.

What are the lessons from this process, and what more do we need to know about it? Lomas (2005) has suggested that summing up research evidence is more than a checklist exercise and requires interpretation, largely by researchers; he cites this research collective as an example of a richer process. On review, this process appears to be investigator-driven, with substantial input from the research community. The research collective model may therefore provide opportunities for more intensive and collaborative involvement of researchers in developing knowledge translation skills and products. In evaluation feedback, researchers involved in the collaborative indicated that they "appreciated the exercise" and valued publication of their work in the synthesis report as well as their interaction with decision-makers. But questions remain about how this process served participating researchers. Was the research collective simply a one-time event, or has it resulted in richer and longer-lasting collaborations? How might the process be applied to other issues and communities of researchers? Is there a will among the research community to extend the research collective process? Could it serve as a model to develop communities of practice (Wenger 1998; Wenger et al. 2002) more clearly oriented towards influencing decision-making? To answer these questions, we will need to understand the long-term effects of this process on the research community.

Other questions relate to involvement of the research collective with the decision-making community. The authors indicate that the process produced results more relevant to decision-makers, but they also suggest that in the future, decision-maker participation could be enhanced. Lavis and colleagues (2006) argue that healthcare managers and policy makers need answers to different questions than those typically addressed in systematic reviews – how and why interventions work, and how to fit interventions into complex healthcare systems, for example. Others make compelling arguments "for moving away from researcher-driven knowledge translation towards co-production of knowledge and a partnership between managers/policy makers and researchers," and argue that this dialogue should be based on critical conversations to establish the content and format of reviews and syntheses in local contexts (Pope et al. 2006). They suggest that "there may well be a place for new forms of research synthesis, as well as for systematic reviews, in informing management and policy, but local partnerships, critical dialogues and reinterpretation in context will be what make a difference in the world of healthcare management and policy making." The research collective advanced such interactions, and may provide a model for making the synthesis process more relevant to decision-makers. However, the description of the process suggests that even though decision-makers were involved, their involvement may have been somewhat limited. At this point we do not know if and how the decision-making community has used the synthesis results and whether there has been continued involvement, partnership or evolution towards a partnered research collective.

What have we learned, and what more do we need to know about this process? Many have argued for advancing and improving synthesis approaches, but there are debates about how best to do this (Lomas 2005, 2006; Greenhalgh and Russell 2006; Lavis 2006; Lavis et al. 2006; Pope et al. 2006; Roger 2006). Funding agencies interested in knowledge translation should take note of the research collective and encourage the research community to learn more from this and other innovative examples.

Correspondence may be directed to: Dr. Charlyn Black, Director, Centre for Health Services and Policy Research and Professor, Department of Health Care and Epidemiology, University of British Columbia, 429 – 2194 Health Sciences Mall, Vancouver, BC Canada V6T 1Z3; email: cblack@chspr.ubc.ca.

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COMMENTARY

The Research Collective: Bridging the Chasm

Le collectif de recherche : comment renflouer le gouffre

by JIM MACLEAN, MD
Team Lead, Primary Health Care Reform
Ontario Ministry of Health and Long-Term Care
Toronto, ON

MARSHA BARNES, MHSC
Business Lead, Primary Health Care Team
Ontario Ministry of Health and Long-Term Care
Toronto, ON

Abstract

Decision-makers in healthcare face many challenges in obtaining, analyzing and applying research results, including multiple priorities, competition among stakeholders and the time required to synthesize evidence. The research collective described by Pineault et al. appears to expedite access to information that can help inform policy decisions. It also challenges both researchers and decision-makers to better understand each other's context. Achieving such an understanding will require us all to step outside our traditional comfort zones, but this greater trust and flexibility stand to benefit all those who work in the healthcare system and those who rely upon it for care.

Résumé

Les décideurs du domaine des soins de santé doivent surmonter de nombreuses difficultés pour obtenir, analyser et mettre en application les résultats des recherches, notamment des priorités multiples, la concurrence entre les différents intervenants et le temps nécessaire à la synthèse des preuves. Le collectif de recherche décrit par Pineault et ses collègues semble accélérer l'accès à l'information utile à la prise de décisions. Il force aussi les chercheurs et les décideurs à mieux comprendre leur contexte respectif. Pour atteindre ce degré de compréhension, il nous faudra à tous sortir de notre zone de confort traditionnelle, mais ce surplus de confiance et de souplesse pourrait être bénéfique aux professionnels du système des soins de santé et à tous ceux qui y ont recours pour obtenir des soins.

* * *

Decision-makers and those who advise them face daily challenges in obtaining, assessing, assimilating and analyzing myriad pieces of information, data and research on complex questions related to government policy and implementation. Policy makers are invariably faced with multiple priorities, competing viewpoints from stakeholders (who selectively utilize research to support their own position) and real-life questions that rarely can wait months or years for the results of traditional research synthesis.

In Ontario, decision-makers are increasingly interested in utilizing the expertise and knowledge that is available from our academic colleagues to inform decisions and help shape the future direction of our healthcare system. The research collective appears to hold considerable promise in expediting access to information that can help answer some important questions.

Our experience in developing, implementing and facilitating change in primary healthcare delivery would support the conclusions of Pineault et al. about the importance of timeliness (although in many instances, even eight months may be too long a timeline), of including some consultation with those involved in policy development and of bringing together researchers involved in related projects.

Primary healthcare organization and delivery is a field in which the questions outnumber the answers. Even where evidence and answers exist, they are often very specific to the system or organization in which they were studied, with uncertain applicability to other settings. Much evidence has been generated recently through the injection of funding from the Primary Healthcare Transition Fund, resulting in greater need for synthesis.

In the absence of clear evidence, policy makers must make decisions using the best information available. This information is often based upon the experience of those in the field, analysis of internal data sources and the advice of those who have studied in the area for many years. Change of the magnitude involved in primary healthcare reform is, by necessity, iterative, and has challenged governments, researchers and providers alike to adopt a more flexible, innovative and dynamic approach.

The research collective challenges us in a different way – to begin to find ways to cross the chasm between the science of research and the reality of the world of the policy maker. To do this effectively, we all need a better understanding of one another's context. Much of the promise of the research collective is in achieving this – not only between government representatives and researchers but also among researchers themselves. Improving understanding requires some degree of trust and flexibility, but the beneficiaries of this effort will be those working in the healthcare system and those who rely upon it for care.

We should all challenge our own beliefs and practices and consider the opportunities and benefits that may result from stepping outside our traditional comfort zones. Governments need to be both proactive and reactive – developing future strategies, adjusting current ones and problem solving on a daily basis. Governments need to support these actions with evidence when it is available, and when it is not, to make decisions based on experience and advice. They must also be able to withstand resistance to change and stay true to their convictions. Researchers are now being called upon more frequently as trusted advisers to government. The challenge to the researcher is to provide timely, relevant advice, often based on less than complete information and analysis. The research collective is a positive step in the direction of bridging the chasm between the world of the researcher and that of the government decision-maker.

RESEARCH PAPER

Performance Measurement in Healthcare: Part I – Concepts and Trends from a State of the Science Review

La mesure du rendement dans les soins de santé : Partie I – Concepts et tendances issus d'un examen de l'état de la science

by CAROL E. ADAIR, MSC, PHD
Associate Professor, Departments of Community Health Sciences and Psychiatry
University of Calgary, Calgary, AB

ELIZABETH SIMPSON, MSC
Health Research Consultant
Red Deer, AB

ANN L. CASEBEER, MPA, PHD
Associate Professor, Department of Community Health Sciences
Associate Director, Centre for Health and Policy Studies
University of Calgary, Calgary, AB

JUDITH M. BIRDSELL, MSC, PHD
Principal Consultant, ON Management Ltd.
Adjunct Associate Professor, Haskayne School of Business
University of Calgary, Calgary, AB

KATHARINE A. HAYDEN, MLIS, MSC, PHD
Associate Librarian, Information Resources
University of Calgary, Calgary, AB

STEVEN LEWIS, MA
President, Access Consulting Ltd.
Adjunct Professor, Department of Community Health Sciences
University of Calgary, Calgary, AB

Abstract

Objective: Performance measurement is touted as an important mechanism for organizational accountability in industrialized countries. This paper describes a systematic review of business and health performance measurement literature to inform a research agenda on healthcare performance measurement.
Methods: A search of the peer-reviewed business and healthcare literature for articles about organizational performance measurement yielded 1,307 abstracts. Multi-rater relevancy ratings, citation checks, expert nominations and quality ratings resulted in 664 articles for review. Key themes were extracted from the papers, followed by multi-reader validation. Information was supplemented with grey literature.
Results: The performance literature was diverse and fragmented, and relevant evidence was difficult to locate. Most literature is non-empirical and originates from the United States and the United Kingdom. No agreement on definitions or concepts is evident within or across disciplines. Study quality is not high in either field. Performance measurement arose in public services and business at about the same time. The evolution of thought on performance measurement ranges from unfettered enthusiasm to sober reassessment.
Conclusions: The research base on performance measurement is in its infancy, and evidence to guide practice is sparse. A coherent multidisciplinary research agenda on the topic is needed.

Résumé

Objectif : La mesure du rendement est considérée comme étant un important mécanisme de responsabilisation organisationnelle dans les pays industrialisés. Ce document décrit un examen systématique de la littérature sur la mesure du rendement dans les domaines des affaires et des soins de santé afin d'éclairer l'élaboration de programmes de recherche sur la mesure du rendement dans les soins de santé.
Méthodes : Une recherche d'articles sur le rendement organisationnel dans des publications sur les affaires et les soins de santé évaluées par les pairs a permis de repérer

1 307 résumés. Des évaluateurs multiples ont déterminé la pertinence de chaque article; on a vérifié les citations, désigné des experts et établi des cotes de qualité. Ces critères ont permis de réduire à 664 le nombre d'articles à examiner. On a dégagé des thèmes clés des documents, puis on les a fait valider par des lecteurs multiples. On a aussi eu recours à la littérature grise pour compléter les données.

Résultats : La littérature sur le rendement était diversifiée et fragmentée, et les preuves pertinentes difficiles à repérer. La majeure partie de la littérature est de nature non empirique et provient des États-Unis et du Royaume-Uni. On ne décèle aucun consensus quant aux définitions ou aux concepts, ni entre les disciplines ni à l'intérieur de celles-ci. La qualité des études laisse à désirer, et ce, dans les deux domaines. La mesure du rendement a fait son apparition dans la fonction publique et dans le monde des affaires à peu près en même temps. L'évolution de la pensée sur la mesure du rendement varie d'un enthousiasme sans réserve à une réévaluation sobre.

Conclusions : La recherche sur la mesure du rendement en est encore à ses balbutiements, et les preuves pouvant guider la pratique sont rares. Un programme de recherche multidisciplinaire et cohérent sur le sujet s'avère nécessaire.

* * *

"… no one knows the extent to which some of the expenditures have brought good or ill to the recipients, and certainly no one knows whether better service might not have been achieved for smaller outlay more intelligently applied."

– Pennsylvania Children's Commission, 1920s
(cited in Beck et al. 1998: 164)

"Collectively (and perhaps belatedly) we have recognized the most important issue facing the health service is not how it should be organized or financed, but whether the care it offers actually works."

– Walshe and Ham, 1997 (Perkins 2001: 9)

In the context of rising healthcare expenditures, performance measurement (PM) is increasingly integral to accountability. Healthcare accountability mechanisms have traditionally included business planning, annual reporting and contracting (Alberta Government 1998). In recent years a richer sense of accountability has emphasized the achievement of goals effectively and efficiently and has stimulated PM. PM has been described most simply as "the use of statistical evidence to determine progress toward specific defined organizational objectives" (State of California 2003), although more comprehensive definitions exist. The PM process typically involves four stages – conceptualization and strategy; measures selection and development; data collection and analysis; reporting and use – and can occur at multiple levels of organizations and systems.

The literature includes reports on performance measurement initiatives across the healthcare spectrum from primary (e.g., Proctor and Campbell 1999) through tertiary care (e.g., Rowan and Angus 2000), public health (e.g., Corso 2000) and the voluntary sector (e.g., Dunn and Matthews 2001) that have been mounted in response to demands from governments, other payers, consumers, proponents of evidence-based practice and accreditation organizations. Substantial resources have been invested in PM system development from the policy level through front-line care delivery (Goddard et al. 1999). Given the scale of investment, a commensurate level of research on PM would be expected. However, because scientific and experiential information about PM spans multiple sources and disciplines, there is no easy way to identify and summarize relevant evidence.

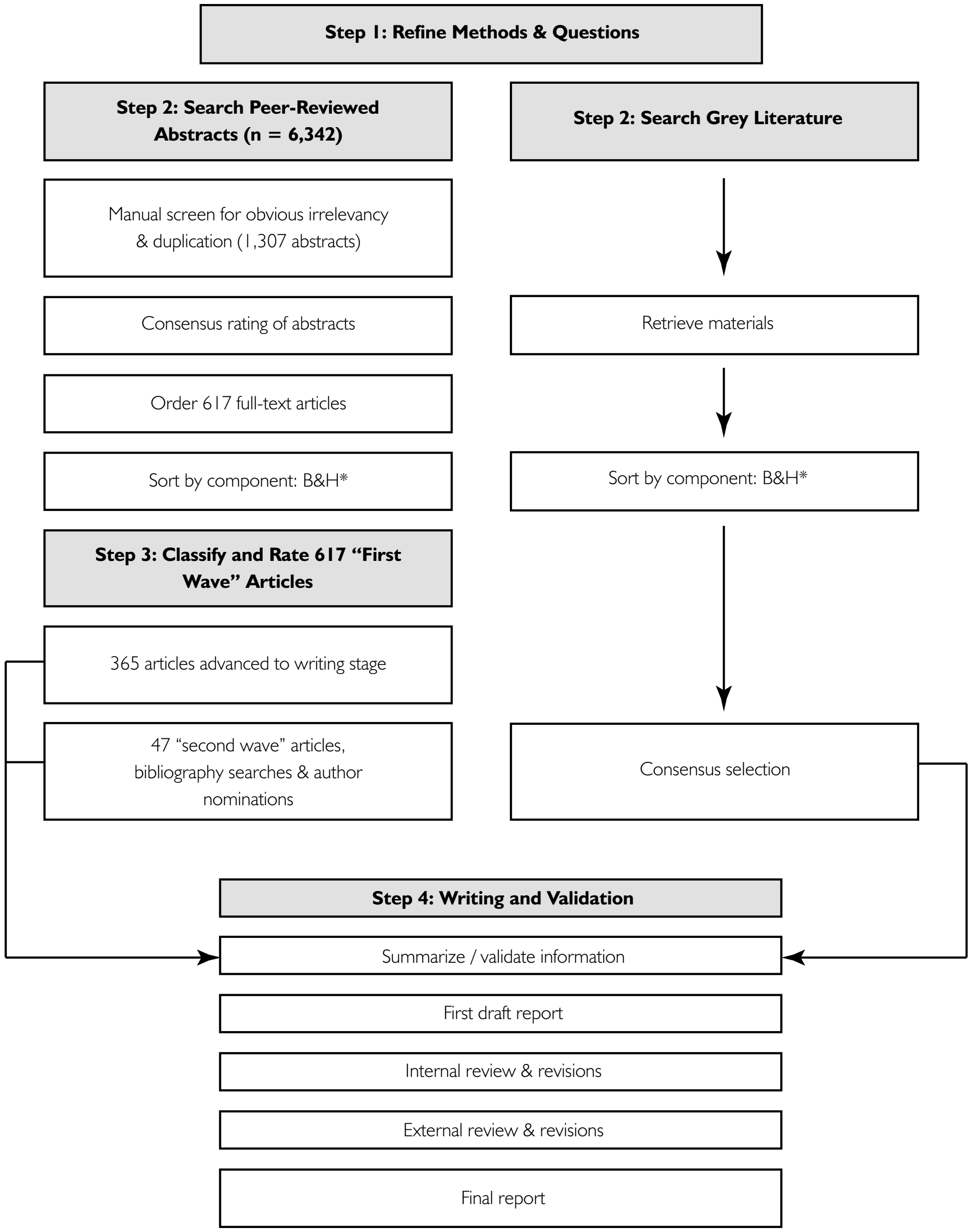
We conducted a systematic review of the business and health PM literature to inform a research agenda on healthcare PM. Our intent was to draw broad issues and themes from diverse sources. This paper outlines methods, summarizes general PM concepts and trends from business/management and healthcare sources and offers recommendations for a research agenda to produce evidence for practice. Part II (which will be published next issue) details findings from the review according to the four stages of PM and outlines implications for practice, including common problems and solutions suggested by PM authors. It also provides a brief update on new developments at the policy level in PM in Canada.

Methods

Methods for systematic reviews of clinical effectiveness studies (ScHARR 1997; Clarke and Oxman 2001) guided our review process, but were not entirely suitable for a broad policy subject. We based our approach on the principle of replicability; in the end, the review was a hybrid of systematic and narrative review methods. There were four steps in the process: (a) refining the review questions, (b) searching for and selecting articles, (c) classifying and rating the articles for quality and (d) writing and validation.

First, to refine the review questions, we received feedback on initial drafts from 22 (54%) of 41 healthcare decision-makers surveyed from across Canada, and in a focus group with four of them. Participants strongly endorsed the need for the review and provided suggestions for scope and content. Specifically, they called for inclusion of the business/management literature based on an interest in cross-sector comparisons and business innovations that might apply to healthcare.[1] The final questions focused on predominant models and frameworks, evidence for impact and recommendations for research.

FIGURE 1. The Article Selection and Review Process



*B = Business, H = Health

Second, a professional librarian (KH) designed and ran searches of the business and healthcare peer-reviewed literature and the grey literature. The peer-reviewed literature searches included the databases ABI Inform, Business Index ASAP, PsycInfo, ABI Inform, Medline, Embase, Cinahl and Web of Science. Key words varied by database, but were close approximations to *performance measurement, performance measurement system* and *health system performance*. Searches were limited to English-language materials for 1992–2002 for health and 1997–2002 for business (to focus on more recent developments). Grey literature provided an appropriate policy and practice context; sources included PM-related Internet sites, conference proceedings, newsletters, press clippings and periodical indexes. The article selection and review process is shown in Figure 1.

The initial 6,342 abstracts from the peer-reviewed literature were screened manually by CA for obvious irrelevancy, since the search terms yielded abstracts about unrelated topics such as occupational and athletic performance. After removal of duplicates, teams of three investigators for each of the two fields independently rated the 1,307 remaining abstracts from the two fields for relevancy based on a criterion statement focusing on organizational-level PM concepts or evidence and research recommendations that had been pre-tested on 50 articles. Full-text papers that rated a "yes" by two of three raters were retained for the review, and the percentage of agreement for this criterion was high (85.3% K = .77; p = .000). This "first wave" of articles numbered 617.

In the third step, six readers in two teams read, classified and rated the papers for quality. Articles were classified by publication year, country, organizational level, patient population (health only) and type of research (non-empirical or empirical). Reading teams also flagged frameworks, definitions, innovations and recommendations for research. Quality rating scales were developed, pre-tested on 20 papers for each article type and revised. Non-empirical and empirical papers were rated on 10- and 15-point scales, respectively. Inter-rater agreement (unblinded) was high (intraclass correlation coefficients were .88 (95% CI .82–.92, p = .000) for empirical articles and .92 (95% CI .88–.94, p = .000) for non-empirical articles. Papers with ratings above the mean were advanced to the writing stage (n = 365), although the cut-off was not strict and some subjective judgments were made at that stage about inclusion based on the pertinence of material to the major themes that were identified to that point. Reference lists for the highest-rated papers were searched, and 21 authors of the highest-rated papers (of 42 contacted) nominated an additional 39 "best" papers on the topic. Forty-seven more papers were included as a result of these citation searches and author nominations ("second wave" activities). All papers were tracked using Access and EndNote databases.

In step four, one reader for each field prepared a written summary, which was validated by a second reader. The principal investigator then wrote a comprehensive draft report after reading all first- and second-wave papers and readers' summaries. Grey literature was incorporated at this stage if it provided important context or additional insight on emerging themes. The draft review was then read and revised by team members. Feedback from two external reviewers was also incorporated.

Results

The "first wave" group of selected peer-reviewed articles included 81 (22%) from the business literature and 284 (78%) from health. First-author country of residence was the United States (69%), United Kingdom (15.3%), Australia (3.6%), Canada (3.6%) and all others (8.5%). The ratio of non-empirical to empirical papers was about two to one (69.3% vs. 30.7%). The business literature had more empirical papers (40.7%) than the health literature (28.0%), which might be attributable to the difference in search timeframes. Mean quality ratings were moderate and variable overall: 9.1 out of 15 (SD 2.93) for empirical papers and 6.6 out of 10 (SD 1.81) for non-empirical papers, even after selection for relevancy and quality. Mean quality ratings were not significantly different for business vs. health papers for non-empirical papers (6.1 vs. 6.0; $p = .66$) or empirical papers (8.8 vs. 9.2; $p = .58$).

Concepts

The concept *performance measurement* has no agreed-upon definition in or across the literature reviewed. It sits within a dizzying array of related theoretical ideas, research- and practice-based tools, initiatives and rhetoric. Nevertheless, the generally implied purpose of PM across all materials was the pursuit of excellence in organized human enterprise. *Performance measurement systems* are also conceptualized in multiple ways with many synonyms, including "organizational performance assessment system" (Leggat et al. 1998), "outcomes management system" (Jones and Brown 2001) and even the more general "continuous measurement process" (Nadzam and Nelson 1997; Rosenblatt et al. 1998). Definitions for all concepts were extracted to an omnibus glossary in the main report (Adair et al. 2003). For each concept, the principal investigator (with concurrence from the review team) selected the definition that seemed to fit best with the most frequently implied meaning across the body of literature (Table 1).

With respect to its function in organizations, some authors characterize PM as only one part of a larger health information framework (Schneider et al. 1999). Others view it as an overarching activity that encompasses a variety of other related initiatives (Neely et al. 1995). PM is described by some as an internal organizational activity only, while others consider its primary purpose to be external, e.g., "PM has become a preferred means of ensuring external accountability" (McCorry et al. 2000: 636). Still others recognize that performance measures have utility for both internal and external reporting (e.g., Trabin et al. 1997).

TABLE 1. Selected definitions for healthcare performance measurement terms

TERM	DEFINITION
Performance	What is done and how well it is done to provide healthcare (JCAHO 2002)
Performance Measurement*	The use of both outcomes and process measures to understand organizational performance and effect positive change to improve care (Nadzam and Nelson 1997)
Performance Indicator**	Markers or signs of things you want to measure but which may not be directly, fully or easily measured (Alberta Government 1998)
Performance Measure	A quantitative tool, such as rate, ratio or percentage, that provides an indication of an organization's performance in relation to a specified process or outcome (JCAHO 2002)
Process Measure	A measure focusing on a process that leads to a certain outcome, meaning that a scientific basis exists for believing that the process, when executed well, will increase the probability of achieving a desired outcome (JCAHO 2002)
Outcome Measure	Not simply a measure of health, well-being or any other state; rather, it is a change in status confidently attributable to antecedent care (intervention) (Donabedian 1968)

*Like this one, many performance measurement definitions included the use of measurement results for organizational improvement that implies performance *management* – and resulted in these two terms being used interchangeably in the literature.
**Despite these distinctions, the terms performance measure and performance indicator were usually used interchangeably in most general discussions about PM because either or both are used in PM.

The relationship between PM and related activities, such as total quality management (TQM), is an area of great conceptual confusion. For example, contemporary quality improvement processes are seen to rely on PM, but PM exercises are also described as having quality improvement activities as a key component. These endeavours seem to be increasingly blurred with time. Accreditation processes now emphasize the use of performance measures, benchmarking activities now often link directly to quality award schemes and TQM is touted as a mechanism to take action on PM results. The lack of conceptual clarity is not surprising, given the breadth of organizational types (e.g., for profit/not for profit) and levels (individual to system) at which PM is applied, and the diversity of disciplines producing PM-related research (at least 17 sub-disciplines were identified). Studies across disciplines were rare.

Performance measures for health have been developed for the three classical components of care defined by Donabedian (1988) (structure, process and outcomes) and at all care levels, from patient to population (Tansella and Thornicroft 1998; McIntyre et al. 2001). At the patient level, PM manifests primarily as measurement of the process or outcomes of treatment; at the service or program level, as program evaluation (measurement of program attributes for planning); at the system level, as a mechanism for organizational control and ensuring efficient use of resources; and at the population level, as the collection and reporting of high-level information for broad planning, policy making and accountability (Thompson and Harris 2001; Coyne 2002; Studnicki et al. 2002). While there are some commonalities in PM across levels, and data for one level are often rolled up for higher-level use, stakeholder priorities for and uses of PM data can be very different by level (Goddard et al. 1998; Legnini et al. 2000).

Current practice in healthcare

Table 2 provides a summary of the relationships among PM-related initiatives and tools as they are described in the healthcare literature according to the predominant level of activity and how the various initiatives seem to have evolved over time.

The business PM literature

In business, PM was traditionally a top-down activity for organizational control (Lebas 1995; Smith and Goddard 2002). In a paper considered profoundly influential, Eccles (1991) predicted widescale redesign of business PM. The idea has now evolved into a more holistic, organizationwide, strategic management approach (Smith and Goddard 2002). Neely (1999) describes an exponential increase in the number of PM publications in the 1990s and the diffusion of PM language in corporate annual

TABLE 2. Healthcare improvement activities and trends

HEALTH SYSTEM LEVEL*	TRADITIONAL ACTIVITIES	CONTEMPORARY ACTIVITIES
Inter-system, international	Comparisons of basic statistics (e.g., life expectancy) (R)	PM with aggregate indicators compared across nations (R)
System (total health system), e.g., provincial health department, Regional Health Authority, Health Maintenance Organization	Global financial measures/ budgeting (P) Administrative data-based health services research (R)	PM across services and programs (P) Outcome-oriented health services research including economic analysis (R)

TABLE 2. CONTINUED

HEALTH SYSTEM LEVEL*	TRADITIONAL ACTIVITIES	CONTEMPORARY ACTIVITIES
Program/Service unit organization	Single program evaluation studies (P/R) Accreditation (P) Quality Assurance (P) Simple comparative benchmarking (P)	PM within programs (P) Organizational development and leadership enhancement (P/R) Multi-service evaluations (P/R) Total Quality Management (P) Accreditation (including quality improvement and PM) (P) Provider profiling (organizational) (P) External audits (a variety in US & UK) (P) Portfolio management measurement tools, e.g., Balanced Scorecard (P/R) Benchmarking (P/R) Management quality awards programs, e.g., Baldrige (P)
Individual client/patient or provider	Clinical judgment and subjective impression of improvement based (usually) on physiologic measures (P) Client satisfaction measurement (P)	PM, including routine process and outcome measurement (P) Evidence-based practice (clinical practice guidelines, care pathways/algorithms, systematic reviews) (R/P) Clinical governance (P) Provider profiling (individual) (P) Individual physician accreditation (US; AMA) (P) Professional development and recertification (CME, audit and feedback, etc.) (P) Outcome effectiveness research, including patient-level longitudinal studies using functioning/quality of life (R)

Developed from the ideas of Bartlett 1997, Grol et al. 2002 and others.
*Where an activity or tool is applicable at more than one level, we have classified it according to the level where it originated or is used most predominantly: R = predominantly a research activity; P = predominantly a practice activity

reports. This explosion of interest is attributed to a need for organizational change spurred by globalization and increasingly competitive markets, as well as an increase in active marketing by PM system and service vendors (Smith et al. 1997; Neely 1999; Malmi 2001).

The non-empirical business literature is characterized by the promotion of largely proprietary systems and the reporting of practical problems (Holloway 2001). Holloway (2001: 170) charges that much of the literature "merely proselytizes for particular models or approaches," contains "a litany of failed or abandoned PM systems" and provides little in the way of analysis of the problematic side of PM. Busby and Williamson (2000: 336) describe the attitude towards PM in business as "simply an unquestioned belief that it leads to positive improvement." Very few organizations have actually quantified change in performance associated with the implementation of PM (Mooraj et al. 1999), and cost–benefit studies are non-existent (Neely et al. 1995).

Few examples of empirical studies of PM system effectiveness were found in the business literature, and most were case series or surveys. In a New Zealand study, Upton (1998) investigated the association between performance measures and organizational performance. Overall, organizations using non-financial measures of the type found in newer PM schemes performed better. Unfortunately, the finding was based on the self-report of one respondent from each of 85 firms, rather than more rigorous evidence. In a longitudinal survey, Fawcett and Cooper (1998) found that between 1989 and 1994, higher-performing companies reported increasing use of measures. Key methodological challenges noted in the business literature included the tendency to attribute any and all organizational improvement to the PM system when other, uncontrolled factors may be present, and the problem of endogeneity (the same measures that make up the PM system are used to evaluate it) (Holloway 2001; McAdam and Bannister 2001). High-quality articles (both non-empirical and empirical) about PM in business that emerged from the review include Neely et al. 1995; Neely 1999, 2000; Bourne et al. 2000; and Holloway 2001.

The health PM literature

PM arose in the public service and private sectors at virtually the same time, unlike other management innovations that typically originate in the private sector and then subsequently move into the public realm (Smith and Goddard 2002). This situation may result, at least in part, from an urgent need for PM in organizational structures where no natural market exists. Business models and tools for PM (e.g., the Balanced Scorecard) have been applied in public services including health, but the public sector has also developed its own systems, instruments and analysis techniques (e.g., Khim and Hian 2001; Smith and Goddard 2002). Although there is no doubt that PM has been implemented more extensively in business (Malmi 2001), the chorus of calls in policy and research documents for its application in public and health services has been pronounced since the late 1980s (e.g., Relman 1988).

Several stages of the evolution of thought about PM emerged from the healthcare literature. During the 1980s and early 1990s, the calls for PM were abundant, along with unfettered enthusiasm for its promise for improving healthcare. This stage could be characterized as the *performance measurement imperative* (Relman 1988; Williams et al. 1992; Hall 1996). The mid-1990s brought rapid, uncoordinated proliferation of measures and systems and, in the United States, a burgeoning support industry. This *proliferation and fragmentation* stage has been colourfully described by Hermann et al. (2000: 149) as a time of "letting many flowers bloom." The later 1990s heralded a distinct *sober reassessment/reflection* period. This stage was likely stimulated by practice experiences that revealed the great cost and complexity of system implementation, multiple failures and lack of standardization that impaired comparability. At this stage, some authors questioned whether PM, or some aspects of it, were even useful or feasible (Epstein 1995; Baumgarten 1998; Jencks 2000). More recently, the literature reflects a trend towards *consensus and initial solutions*, including acknowledgment of the complexities of PM, a redirection of energies towards more thoughtful, problem-solving approaches in practice (Viccars 1998; Jarvi et al. 2002; Mannion and Davies 2002; Smee 2002) and calls for broader consensus about PM at all levels (e.g., Bishop and Pelletier 2001; McLoughlin et al. 2001).

The literature on the effectiveness of healthcare PM is also sparse, but the general view is that there is little evidence that PM schemes have had either indirect impact on behaviour or direct impact on the quality of patient care or health gain *at the system level*. While many isolated examples of successful quality improvement initiatives can be found, few evaluations of organizationwide PM exist. Among the notable reported successes on a large scale include the transformation of the Veterans Health Administration system in the United States in the 1990s (Kizer et al. 2000) and improvements in access to primary healthcare in the United Kingdom (Pickin et al. 2004), published since our review. The extent to which these system improvements are attributable to the PM initiatives that made it possible to chart progress is not reported.

Many initial claims about PM effectiveness are purely anecdotal. For example, in the context of accreditation in Australia, Collopy (1998: 175) reports that the Australian Council on Healthcare Standards "has evidence of numerous alterations in practice and improvement in patient care induced by indicator monitoring," and in the context of an application of the Balanced Scorecard (BSC) at Duke Children's Hospital, Voelker et al. (2001) provide an example of reduced cost per case, profitability, patient satisfaction, reduced length of stay and reduced readmissions. Grol et al. (2002) contend that there is more evidence about the effectiveness of traditional clinical-level interventions, such as audit/feedback and continuing medical education, than about newer strategies for health services improvement, such as portfolio learning and organizational development. In a review of PM models, Leggat et al. (1998: 8) conclude that most were "in the early stages of development with no hard evidence as to their long-term impact."

Some weak evidence of positive impact comes from PM-system user reports. These range from general satisfaction with the PM system to user opinions about specific changes, such as in administrative or care processes (Lemieux-Charles et al. 2000), to reports of improvement resulting from PM-based action (Turpin et al. 1996). Smith (1993) also provides some examples of reported potential for adverse effects of PM derived from case study interviews. However, uncontrolled case studies and opinions about systems have significant limitations in supporting causal inferences about the impact of PM on health services improvement itself (Hulley et al. 2001). These study designs, as their authors frequently acknowledge, cannot rule out other explanations for their findings, including historical trends and reporting or selection biases (Turpin et al. 1996; Smith 1993).

Our review uncovered only a handful of empirical studies that examined PM effectiveness more directly by including actual measures of health services outcomes. Studies supporting and refuting attribution of reductions in coronary bypass surgery mortality to publication of performance data are reviewed by Jencks (2000). Longo et al. (1997) report positive changes in response to indicator information in the context of obstetric care, and Kazandjian and Lied (1998) found positive impact of participation in a multi-hospital PM project on caesarean-section rates. Finally, in a time-series study, Petitti et al. (2000) demonstrated that even in the absence of incentives, physician-specific profiling of process and outcomes positively influenced diabetes care organizationwide.

Overall, the clarity of ideas in the non-empirical literature and the quality of empirical work is stronger in more recent health literature. However, empirical studies remain varied with respect to questions and methods, and no coherent research direction is evident. Multidisciplinary papers were rare. Of particular note are the variety of perspectives and approaches in the US literature, the depth and general theoretical quality of the UK literature and the relative paucity of Canadian literature. At least two dozen high-quality papers on healthcare PM were identified and listed in an appendix to the full report (Adair et al. 2003). These are recommended as key readings in the field for researchers and decision-makers (Adair et al. 2003).

Discussion

Our review was challenged by the diverse sources and locations of the knowledge and practice base on PM. It required a breadth of search and synthesis far greater than the scope of a systematic review on a clinical question. This situation limited the depth of the review on any single aspect of PM, but allowed us to identify broader themes and issues that were generalizable across sources. More in-depth reviews of specific topics and the many strands of relevant empirical literature are warranted. The diversity of terms and discipline-specific perspectives also necessitated that we cast a large search net (favouring sensitivity over specificity), resulting in a labour-intensive review process. Of particular note, there was almost no convergence on author-nominated papers and only 33% overlap between nominated and selected papers, further evidence that a bounded and identifiable PM literature does not yet exist. Despite these limitations, the review identified a rich set of PM research and practice-related issues, which themselves raised two fundamental questions for our team.

First, there seems to be a simple unifying concept of performance, defined as how an entity does in relation to articulated goals and/or other similar entities. Performance in this context is entirely relative; its meaning is rooted in the gap between the "is" and the "ought." There can be measures that do not connote performance; indeed, the healthcare system is full of measures that merely describe quantities. A very frequent sentiment in both the business and health literatures is that PM must become more about *management* than just measurement, more about action rather than just awareness.

Second, the issue of causality is a difficult one to disentangle, that is, the relative roles of PM systems and data, leadership and management factors in producing change. PM systems are essential to *documenting* improvement; it is not clear how and whether they are supposed to cause it, or whether a culture of improvement and focused achievement of performance, united by well-understood goals, can lead to good performance even in the absence of much performance measurement. The causal assumptions of authors whose articles were reviewed were rarely made explicit. A unifying theory for PM that encompasses this complexity for both fields – and perhaps across fields – does not exist and is greatly needed. Such questions require a greater level of research sophistication in both theory and methods.

Conclusion

An unequivocal finding of this review was that the science of PM is in its infancy, lagging far behind practice in both healthcare and business. The necessity of PM and its potential benefits are widely supported, but rhetoric and good intentions appear to outweigh demonstrations of successful implementation. Where PM is implemented, there is little substantive evidence of positive impact on decision-making, improvement in health services delivery or health outcomes. Many authors advocate generally for more PM research; others call for a specific research program or agenda (Neely et al. 1995; McLoughlin et al. 2001). For example, Kaplan and Norton (2001: 160) suggest that "researchers can now begin a systematic research program, using multiple research methods to explore the key factors in implementing more effective measurement and management systems." Johnson (1998: 253) advocates an international research effort: "The shape of a research agenda, so badly needed in this field, should not depend on one vision of future healthcare delivery. The utility of research will be enhanced if it is independent of any particular form of healthcare delivery. Furthermore, there may be important, practical reasons to plan and orchestrate the research internationally."

The good news is that more rigorous studies of system-level PM are starting to appear. A stellar example is the recent publication by Beck et al. (2005), published after our review was complete. While this study found no evidence that a PM-related intervention (report card feedback on acute myocardial infarction care) changed practice, more research of this calibre will no doubt identify specific PM approaches and mechanisms that can achieve health gains. In our view, effective research in this field needs to go beyond the emergence of quality research by individual research teams. Advancement of the field depends on a comprehensive and coordinated research agenda, including programmatic funding, standard nomenclature, theory development, international and transdisciplinary projects, innovative research–practice partnerships and mechanisms to optimize knowledge transfer and exchange.

NOTES

1. The mental health literature was separated as a special case study of the health literature. Findings specific to that review are not presented in this paper.

Correspondence may be directed to: Carol E. Adair, MSc., PhD, Associate Professor, Depts. of Psychiatry and Community Health Sciences, Room 124, Heritage Medical Research Building, 3330 Hospital Dr. NW, Calgary, Alberta T2N 4N1, Tel: 403-210-8805, Fax 403-944-3144

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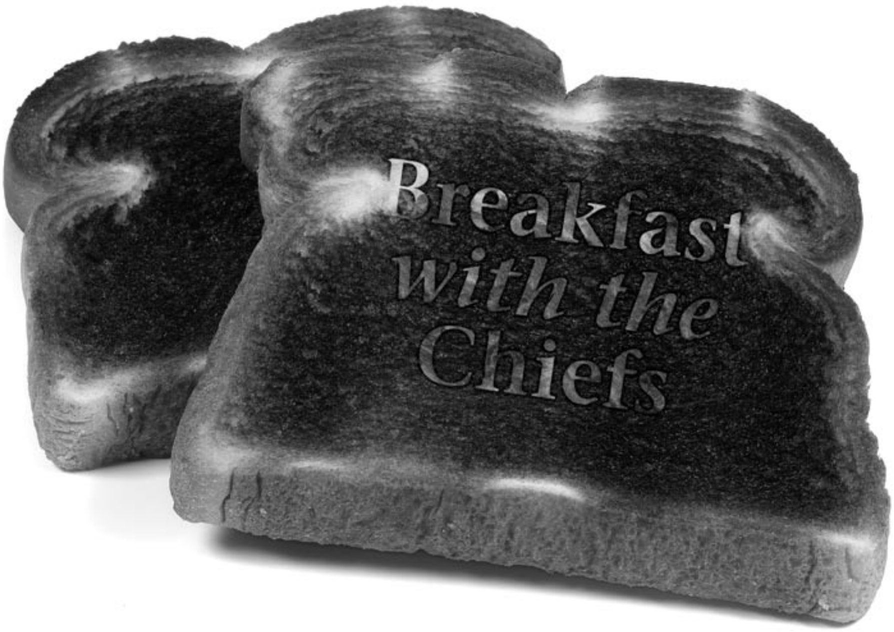
For an examination of lessons from this systematic review for research and practice see Volume 2 Issue 1 for:
Performance Measurement in Healthcare: Part II – State of the Science Findings by Stage of the Performance Measurement Process

A systematic review of the peer-reviewed and grey literature suggests the need for an approach to performance measurement that addresses issues of organizational culture, stakeholder needs, the identification of meaningful and strategic performance measures, the potential for unintended effects and the application of findings to achieve healthcare improvement.

Pour un examen des leçons tirées de cet examen systématique pour la recherche et la pratique, voir l'article intitulé **La mesure du rendement dans les soins de santé : Partie II – Résultats de l'examen de l'état de la science, par étape du processus de mesure du rendement** dans le Volume 2, Numéro 1.

Un examen systématique d'articles revus par les pairs et de la littérature grise suggère qu'on a besoin d'élaborer une méthode de mesure du rendement qui aborde la culture organisationnelle, les besoins des intervenants, la détermination de mesures du rendement significatives et stratégiques, le potentiel d'effets non prévus et l'application des constatations afin d'améliorer les soins de santé.


Breakfast
with the
Chiefs

RESEARCH PAPER

The Impact of Implementing Managed Competition on Home Care Workers' Turnover Decisions

L'incidence de la mise en oeuvre d'une concurrence dirigée sur les décisions d'emploi des travailleurs des soins à domicile

by MARGARET DENTON, PHD
Gerontological Studies, Department of Sociology
McMaster University, Hamilton, ON

ISIK URLA ZEYTINOGLU, PHD
Human Resources & Management
DeGroote School of Business, McMaster University
Hamilton, ON

SHARON DAVIES, MA
Gerontological Studies
McMaster University, Hamilton, ON

DANIELLE HUNTER, FA
Department of Epidemiology and Biostatistics
McMaster University
Hamilton, ON

Abstract

This paper addresses the question: Did the implementation of managed competition in Ontario increase turnover in home care agencies? This question is addressed through a case study analysis of the impacts of tendering on the exiting home care labour force from three non-profit home care agencies during the period 1997 to 2001 in a mid-sized city in Ontario. These agencies provided 85% of the market share in 1996. Findings showed that 52% of the nurses and personal support workers (PSWs) left their agency over the five-year period. Analysis of the turnover data showed a temporal association between the implementation of managed competition and turnover. Additional support for the argument that the implementation of managed competition increased turnover is provided through analysis of a questionnaire sent to nurses and personal support workers who had left their agency during this period. Respondents indicated dissatisfaction with their pay, hours of work, benefits, heavy workload and lack of support from their supervisors/managers (all factors affected by the marketization of the home care sector) as reasons for leaving. Of those employed, only one-quarter remained in home care; most of those remaining were working in other healthcare fields such as hospitals and long-term care institutions. However, about one-third of employed PSWs were no longer working in the healthcare field.

Résumé

Ce document aborde la question à savoir si la mise en oeuvre d'une concurrence dirigée en Ontario a contribué à un roulement accru de la main-d'œuvre dans les agences de soins à domicile. La question est examinée grâce à une analyse d'études de cas sur l'incidence des processus d'appels d'offres sur la main-d'œuvre sortante de trois agences de soins à domicile sans but lucratif pour la période de 1997 à 2001 dans une ville de taille moyenne de l'Ontario. Ces agences fournissaient 85 % de la part de marché en 1996. Les résultats indiquent que 52 % des infirmières et des préposés aux services de soutien à la personne (PSSP) ont quitté leur agence au cours de la période de cinq ans. Une analyse des données sur le roulement de la main-d'œuvre a démontré un lien temporel entre la mise en œuvre d'une concurrence dirigée et le roulement. L'argument voulant que l'instauration d'une concurrence dirigée ait augmenté le roulement des travailleurs est en outre corroboré par l'analyse d'un questionnaire envoyé aux infirmières et aux préposés aux services de soutien à la personne qui avaient quitté leur agence pendant cette période. Les répondants ont cité, comme motifs de leur départ, leur salaire, leurs heures de travail, leurs avantages sociaux, leur charge de travail excessive et le manque de soutien de la part de leurs superviseurs/gestionnaires (tous des facteurs touchés par la « marchéisation » du secteur des soins à domicile). De ceux qui travaillaient, seulement un quart étaient restés dans les soins de santé; la plupart des autres avaient opté pour des cadres d'exercice différents tels que les hôpitaux et les

établissements de soins de longue durée. Cependant, environ un tiers des PSSP actifs ne travaillaient plus dans le domaine des soins de santé.

The retention of home care workers has been identified as a major challenge for home care provider agencies (Caplan 2005; Stone 2001; Cushman et al. 2001a,b). While there are no national or even provincial statistics on turnover rates in home care, the Ontario Community Support Association (2000) estimates that the average turnover rate for home care workers is double to triple the rate of other healthcare workers across Canada (25%–40% compared to 12%, respectively). The national Canadian Home Care Human Resources Study shows that workers are leaving home care and taking better-paying jobs in the institutional and acute care sectors (Human Resources Development Canada 2003b). Additionally, many trained personal support workers (PSWs) may be leaving the home care sector altogether (Caplan 2005).

Because home care in Canada falls under provincial jurisdiction, organization and delivery vary from province to province (Dumont-Lemassen et al. 1999). In 1997, the Ontario government shifted from a system largely organized and run by the non-profit sector to a market-based system whereby service provider organizations compete for contracts to provide home care services (Baranek et al. 2004; Cuttler and Waine 2000). This system is known locally as managed competition. Although research on the impact of restructuring of the home care system has been identified as a high priority (Armstrong and Armstrong 2003; Lowry 2002; Koehoorn et al. 2002), little research on this topic has been done in Canada (but see Abelson et al. 2004). Our study attempts to begin to fill that void.

This paper examines the impact of the implementation of managed competition on nurses' and home support workers' decision to leave their agency. We conducted the analysis through a case study of the impacts of tendering on an exiting home care labour force. We also examined the reasons home care workers provided for leaving their agencies and the type and location of their subsequent job. To gather in-depth information on this topic, we twice surveyed home care nurses and personal support workers in a medium-sized city in Ontario: once in 1996, prior to managed competition, and again in 2001, when managed competition had been established. In 1996, the agencies surveyed provided home care services to 85% of home care recipients in that city.

The Marketization of Home Care in Ontario

Many different models are used in the procurement of home care services. In Canada, four models are currently used: public provider (all providers are public employees); public professional and private home support (public employees provide professional care, and home support care is contracted to private agencies); mixed public and private (public employees provide case management, and services are provided by either private or public employees); and contractual (publicly funded services are delivered by a mix of for-profit and not-for-profit agencies that are chosen to deliver service through a quasi-market model such as Ontario's managed competition process) (Caplan 2005; Dumont-Lemassen et al. 1999).

… the Ontario government has shifted care that was once delivered in the hospital to the community. Patients are discharged from hospital into home care services "quicker and sicker," and home care budgets have not kept pace with the increase of clients coming into care.

In Ontario, successive provincial governments have been attempting to create a "one-stop shopping" approach to long-term care, resulting in the implementation of a plan in 1997 that involved the replacement of 74 home care and placement coordination programs in the province with 43 Community Care Access Centres (CCACs) (Baranek et al. 2004). Under this new system, the home healthcare system has changed from a "cooperative model" to a "managed competition model." In the earlier cooperative model, not-for-profit organizations worked together to provide home healthcare in a shared market-funding agreement. In the managed competition model, these organizations and the new entrants (who are primarily for-profit healthcare organizations) bid competitively for multi-year contracts. In principle, under managed competition the agencies that can provide quality care at the lowest cost win the contracts (Sutherland and Marshall 2001). The rationale is that the introduction of market principles will provide greater cost efficiencies in the system (Armstrong and Armstrong 2003).

The restructuring of both the hospital and home care sectors may be affecting the retention of workers in home care agencies (Abelson et al. 2004). It is difficult to clarify the effects, as both sectors may be contributing to turnover in direct and indirect ways. It is not the intent of this paper to discuss the restructuring of the hospital sector, but it is worth noting that the Ontario government has shifted care that was once delivered in the hospital to the community. Patients are discharged from hospital into home care services "quicker and sicker," and home care budgets have not kept pace with the increase of clients coming into care. Caplan's (2005: 3) review of the competitive bidding process used by Ontario's CCACs shows that in 2004/2005 acute care clients accounted for the largest proportion of clients receiving home care, and there was concern that the trend towards serving more acute care clients was occurring at the expense of maintenance clients. At the same time, funding constraints were imposed on the home care system, resulting in a decrease in nursing visits and homemaking hours over the previous four years (Caplan 2005).

Under managed competition, both for-profit and not-for-profit home care agencies respond to a request for proposals (RFP) and compete on a fee-for-service basis every three to four years, although the initial contracts were shorter as managed competition was rolled out. RFPs for nursing services were introduced in 1997 and in 1999. For PSWs, the first RFP was introduced in 1998 and the second in 2000. Results of competitive bidding could mean the loss of jobs for home care workers, or the hiring of additional home care workers if a new contract area was won. The move to a competitive environment led to increased casualization of work (i.e., many more part-time and temporary jobs and a shift to elect-to-work care), increased job insecurity and decreased pay and benefits for home care workers (Caplan 2005; Abelson et al. 2004; Human Resources Development Canada 2003a). This casualization of the home care sector allows employers a flexible labour supply whereby employers can adjust the supply to correspond with changing needs. Casualization permits employers to keep costs down by eliminating the employer's obligations to provide benefits such as vacation, sick leave, extended medical coverage and pensions (Human Resources Development Canada 2003a). The Canadian Home Care Human Resources Study showed that the wages of home care workers varied by union status and type of employer for registered nurses, licensed practical nurses and home support workers. Across all three groups, persons working for government or regional health authorities received the highest rates of pay, while home care workers in non-unionized, private, for-profit agencies received the lowest (Human Resources Development Canada 2003a: 25).

Work in the home care sector has intensified, meaning that workloads are heavier. Owing to a reduction in the time for visits, home care workers are expected to finish tasks in a shorter period of time and to visit more clients per day (Francis and Netten 2004; Aronson and Sammon 2000). This intensification is due to many factors, including the shift to more acute care, the advance of medical technology, the shortage of funding and the marketization of care (Zeytinoglu et al. 2003; Human Resources Development Canada 2003a).

Methods

Design

This inquiry employs a case study design, which is useful for understanding the development of public policies and to gather in-depth information about a subject

(Johnson and Joslyn 1995). It is characterized as a guided empirical inquiry in which a contemporary phenomenon is investigated within its real-life context. The design is particularly useful when separating the boundaries between phenomena and context is difficult, and when there are multiple sources of evidence (Yin 1989). The case study design is used in research when the researcher is unable to assign subjects, manipulate variables or control the context of the study. Typically, in case studies a number of data sources are used. In terms of a physical location, our study is a case study of the home care sector in a mid-sized city in Ontario.

Data collection

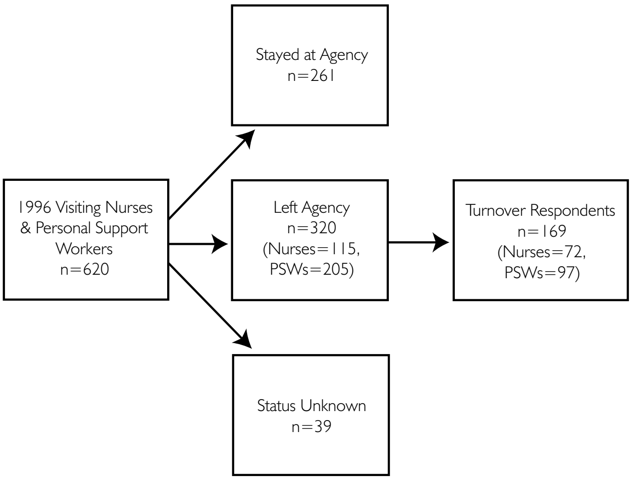
In an earlier research project, we worked in partnership with three not-for-profit community and social service agencies in a mid-sized city in Ontario to study the relationship between the work and health of home care workers (Denton et al. 2002a,b; Zeytinoglu et al. 2000, 2002). Under a service agreement, these agencies worked with the local home care program to provide care to clients in their homes. The first agency provided nursing services and administered the home care program; the second provided nursing services and some visiting home support services; and the third agency provided the majority of the visiting home support workers. While other agencies had overflow contracts with home care, these three non-profit agencies provided about 80% to 85% of home healthcare in this city in 1996.

That same year, after receiving ethics approval from agency ethics committees and the university ethics committee, the three participating agencies provided the researchers with a list of their current employees, and we mailed a questionnaire to 1,346 employees of the three home care organizations, excluding the chief executive officers. In total, 891 respondents returned their questionnaire, for a response rate of 66%. Of these, 620 respondents identified themselves as either visiting nurses (n=214) or personal support workers (PSWs) (n=406). The remaining respondents included case managers, therapists, supervisors, managers and support staff. This paper focuses on the visiting nurses and PSWs.

In spring 2001, we approached these agencies with our list of their 1996 employees and asked them to identify those currently employed by their agency.[1] We then cross-checked this list to our database records and identified those employees that responded to the 1996 survey but had left the agency between 1996 and 2001. We next verified their current address against telephone directories and attempted to locate those who had moved within the five-year period. As shown in Figure 1, of the 620 nurses and PSWs, we were able to identify 320 former employees (115 nurses and 205 PSWs). In fall 2001, a self-completion questionnaire – the Survey of Former Employees – was mailed to these former employees. In total, 169 questionnaires were returned for our sample of turnover respondents, representing a response rate of 53%.

The Survey of Former Employees asked why these workers had left and asked them to list all jobs held since leaving the 1996 agency. For each job listed, we asked the type of job. Lastly, we asked respondents for any additional comments.

FIGURE 1. Study sample



Analysis

Focusing on our case study region and the three not-for-profit provider agencies, we first calculated the proportion of nurses and PSWs who left during the five-year period, 1996–2001.[2] To answer the question, "Did the implementation of managed competition affect the turnover in these home care agencies?" we considered the temporal association between the tendering process and the proportion of home care workers who left their agencies each year.

Second, descriptive data from the Survey of Former Employees were used to answer the questions: "Why did you leave your 1996 employer?" and "What type of job are you currently working at?" Further, in a qualitative analysis, we used the open-ended comments made by respondents at the end of the questionnaire to inform our analysis.

Results

Of the 620 visiting home care workers employed by the three non-profit agencies in 1996, 320, or 52%, had left the agency between spring 1996 and spring 2001 – a

TABLE 1. Five-year turnover, nurses (n=214) and personal support workers (n=406)

STATUS	NURSES PERCENT (N)	PSWs PERCENT (N)
Current Employee	42.5 (91)	41.9 (170)
Left Agency – Non-respondents	20.1 (43)	26.6 (108)
Left Agency – Respondents	33.6 (72)	23.9 (97)
Status Unknown	3.7 (8)	7.6 (31)
Total	100 (214)	100 (406)

TABLE 2. Year workers left agency

YEAR LEFT AGENCY	NURSES (N=72) PERCENT (N)	PSWs (N=97) PERCENT (N)
1996*	11% (4)	20.6% (10)
1997	18.1% (13)	18.6% (18)
1998	16.7% (12)	29.9% (29)
1999	27.8% (20)	15.5% (15)
2000	20.8% (15)	9.3% (9)
2001*	16.6% (6)	12.4% (6)
Missing Date Left	2.8% (2)	10.3% (10)

* Data were collected for a six-month period and adjusted to a 12-month period

five-year period. The turnover rate for nurses was 54% and for PSWs 50% (Table 1). Table 2 shows the year they left the agency. In the last six months of 1996, prior to the implementation of managed competition, 10% of the nurses and 20% of the PSWs in our study left their agencies. Following managed competition, the proportion of home care workers who left their agency increased, peaking at 28% for nurses in 1999 and at 30% for PSWs in 1998.

Did the implementation of managed competition affect turnover in home care agencies? To answer this question, we relied on three sources of information. First, we interpreted turnover, measured in Table 2 as the proportion that left their agency each year, through the lens of the implementation of managed competition in this city. Second, we examined the reasons provided by respondents for leaving their agency from the Survey of Former Employees. Third, we analyzed the verbatim responses provided in the final section of the survey.

Nurse services

In 1997, the first request-for-proposal (RFP) cycle for 25% of the CCAC nursing care volume was issued. Agency 1 competed and lost a major area within the city; that volume of nursing care was transferred to Agency 2 and to a new not-for-profit agency. The proportion of nurses leaving their agencies in 1997 and 1998 rose to 18% and 17% respectively, as nurses switched agencies or left for other jobs. In 1999, the second RFP cycle was called for the remaining 75% of the original volume. Agency 1 won two-thirds of that volume, with the remainder going to a new agency. Agency 2 lost an area it had held for over 20 years, but did manage to pick up a new contract area in another city. While Agency 2 did not lay off employees during that period, management did ask some of their nurses to transfer to the new contract region. Some nurses were not happy about moving out of their core areas and voluntarily left the agency. So the dramatic rise in the turnover to 28% in 1999 can largely be explained as fallout from managed competition and the loss of both volume and area by the two nursing agencies.

In 2000, there was a strike at Agency 1, during which the CCAC permanently transferred nursing clients to other agencies. After the strike, nurses had to be permanently laid off because of the limited volume of work available.

In 2000, there was a strike at Agency 1, during which the CCAC permanently transferred nursing clients to other agencies. After the strike, nurses had to be permanently laid off because of the limited volume of work available. Further, some nurses may have left on their own. The strike partly explains the 21% turnover in 2000. By 2001, turnover appeared to stabilize in the second year of the three-year contract period. Although not included in this study period, a major decrease in volume in fall 2001 again influenced turnover in the nursing agencies. Agency 3 had no nurses employed and therefore is not discussed here.

Personal support workers

The first contract for PSWs was not issued until 1998, and Agency 2 and Agency 3 maintained their volumes in the 1996–1997 period. Turnover increased during that time for PSWs but jumped to 30% for those who left their agencies in 1998, owing to a number of factors. In that year, while Agency 3 won its contract, Agency 2 lost its contract for PSWs. In addition, all home care agencies were losing employees to long-term care facilities, where wages were higher and benefits were better (Denton et al. 2003). Lastly, funding policy changed. Clients who had been receiving three to four hours of care were cut to one-hour visits for personal care only. This meant that PSWs who had made two or three visits a day were now making six or seven visits, many by bus travelling across the city. These factors contributed to turnover among PSWs.

In 1999, turnover for PSWs began to decrease, due partly to the introduction of a neighbourhood team model by Agency 3 that reduced the time travelled between clients. Agency 3 won a second contract in April 2000 that was to be a four-year contract till March 2004. Turnover for PSWs levelled off in 2000 and 2001, with less than 10% of study respondents leaving their agency during this stable contract period. But in December 2001, after our survey was conducted, the CCAC, as the issuer of the contract, faced a budget deficit and introduced eligibility cuts. Client volumes were reduced from 11,000 persons receiving care to 7,000. Agency 3 was unable to provide care under the decrease in volume and a corresponding increase in complexity of care. This agency had to close in August 2002.[3]

TABLE 3. Reasons for leaving agency

REASON LEFT AGENCY	NURSES (N=72) PERCENT (N)*	PSWs (N=97) PERCENT (N)*
Pay not satisfactory	41.7 (30)	23.7 (23)
Hours of work not satisfactory	27.8 (20)	30.9 (30)
No guarantee of hours or client visits	25.0 (18)	30.9 (30)
Lack of support from supervisors/managers	29.2 (21)	18.6 (18)
Health reasons	18.1 (13)	25.8 (25)
Work-related stress	25.0 (18)	12.4 (12)
Lack of job security	22.2 (16)	13.4 (13)
Heavy workload	27.8 (20)	5.2 (5)
Retired	15.3 (11)	11.3 (11)
Benefits not satisfactory	16.7 (12)	10.3 (10)
Lack of challenging opportunities at agency	11.1 (8)	13.4 (13)
Lack of support from co-workers	13.9 (10)	7.2 (7)
Laid off	**	10.3 (10)
Lack of educational opportunities	13.9 (10)	6.2 (6)
Home or family responsibilities	9.7 (7)	7.2 (7)
Did not like working at agency	12.5 (9)	5.2 (5)
Work-related injury	**	9.3 (9)

* Percentages do not add up to 100% because respondents were asked to "check all that apply"

** Less than 5 cases

Reasons for leaving

What reasons did nurses and PSWs who left their agencies give for leaving their place of employment? Descriptive data from the Survey of Former Employees indicate that most left because of concerns with their pay, hours of work, job security, support from supervisors and/or managers, heavy workload, unsatisfactory benefits and other factors. Some nurses and PSWs retired or left the agency to further their education, or for home or family reasons (Table 3).

Reasons for leaving varied by occupation. A higher proportion of nurses than PSWs indicated unsatisfactory pay, lack of support from supervisors, work-related stress, job insecurity, heavy workload, unsatisfactory benefits, lack of support from co-workers, lack of educational opportunities and simply not liking to work for that agency. PSWs were more likely to mention unsatisfactory hours of work, no guarantee of hours or client visits, health reasons, being laid off or having a work-related injury.

In the open-ended section of the questionnaire, many respondents told us that they were happy with their jobs prior to the implementation of managed competition but became unhappy with the changes made under the new competitive process. According to respondents, managed competition resulted in higher workloads, more client visits per day, job insecurity, decreased continuity and quality of care to clients, increased stress and lowered pay and benefits. One nurse described the change:

> It could be very pleasant and satisfying, but as government cutbacks and budget constraints developed, it became a frightful and stressful place to work. Workloads [procedures and patient daily visits] increased greatly, which led to impossible time management of daily caseloads, resulting in daily overtime hours – no coffee or lunch breaks – plus additional hours spent on paperwork and preparation for next day's workload.

The marketization of home care created an unstable work environment in home care, especially for agencies in our study. Based on their written comments, we argue that some home care workers left because of the instability of the home care environment, especially the RFP process. For example, one nurse said she "was seconded to another organization and when that contract ended, [Agency 2] could not guarantee the same position." Another described how her clients changed when the contract with the CCAC changed to another part of the city: "My work area changed to the city core – different types of clients – did not enjoy working in this area. We lost the contract with the CCAC [in a more pleasant area of the city]." PSWs also experienced job insecurity during the tendering period. In the verbatim comments, one PSW said that it was "very difficult being an employee during [the] RFP process because of concerns around job security. If we got the RFP, we would have too much work and they were hesitant to increase staffing, and if we did not get the RFP, we would lose our jobs."

Personal support workers who responded to our survey described how they were forced to take a cut in pay in order to keep their jobs, a direct result of the change to a competitive environment. They noted their extremely low pay. One said:

> I was not even taking home $19,000/year. Yet my responsibilities were increasing and the time to do my job decreased. … I quit because the working conditions (time per client and travel time) are terrible and wages are the same as three years ago [total, eight years ago]. I can work pumping gas for the same money, with less responsibility and yet I will get yearly increases. Would you stay? The shame of it was I really enjoyed my job. I would have stayed.

This PSW makes an important point about the low wages in home care and explains why so many of the respondents to our survey did not find or seek jobs in the home care sector.

Some survey respondents felt that the implementation of managed competition resulted in a reduction in organizational support to home care workers. One nurse described the result of the loss of support from colleagues and the agency: "When the RFP process stripped resources from community agencies, nurses lost many of their opportunities for face-to-face support, for example, educational committees, project work, team meetings, office entry. The isolation became unbearable and the workload unsustainable." A PSW described how good supervisory support could contribute to retention: "[I had an] extremely supportive supervisor, who was one of the reasons I stayed as long as I did. Support of [my] supervisor was and is a very important value to me in the workplace."

In competing for contracts with the CCAC, agencies competed on both price and quality. Respondents to our survey told us that the quality of client care decreased dramatically with the onset of managed competition. One home support worker described it this way:

> I was on the first home care case here in [city]. Our original purpose was to keep seniors in their homes. We cared about our clients and it was very satisfying both for our clients and workers. Now it's just about money. Always a new worker for one hour. It's just a business now. I guess that is progress.

In summary, the comments written by visiting home care workers on the Survey of Former Employees lend support to our conclusion that the implementation of managed competition increased turnover in the three home care agencies studied.

We also asked respondents about their subsequent job to learn whether they stayed in home care or left for another sector. Two-thirds of the nurses (68%) and one-half of the PSWs (55%) were then employed. Table 4 shows that 36% of the

TABLE 4. Subsequent job

	NURSES (N=48) PERCENT (N)*	PSWs (N=53) PERCENT (N)*
Currently Employed	66.7 (48)	54.6 (53)
Job Title		
Case Manager	16.7 (8)	0
Clerical	**	9.4 (5)
Manager or Supervisor	**	**
Nurse	56.3 (27)	**
Home Support Worker	0	26.4 (14)
Health Care Aide	0	22.6 (12)
Other	16.7 (8)	32.1 (17)
Missing	0	1.9 (1)
Type of Business		
Non Healthcare	14.6 (7)	35.8 (19)
Hospital	29.2 (14)	**
Nursing Home	**	17.0 (9)
Home Care	27.1 (13)	22.6 (12)
Other Healthcare	22.9 (11)	15.1 (8)
Missing	0	1.9 (1)

* Percentages do not add up to 100% because respondents were asked to "check all that apply"
** Less than 5 cases

employed PSWs and 15% of the nurses were no longer working in the healthcare field. About one-quarter of the nurses (27%) and PSWs (23%) remained in home care, with the nurses finding employment in the hospital sector (29%) and other healthcare (23%), and the PSWs finding employment in nursing homes (17%) or other healthcare (15%). Only 26% were currently working as PSWs.

Discussion

High turnover is a significant problem in home care because retention of workers promotes continuity of care for clients and families, reduces costs (training for new workers), promotes a stable work environment and allows for long-range planning (Human Resources Development Canada 2003c: Appendix B). The findings presented in this paper provide evidence that the implementation of managed competition increased the turnover for home care workers in a mid-sized city in Ontario. While we argue that the introduction of market-modelled care in Ontario increased turnover, we cannot ascribe all the increase in turnover to the marketization of home care. As discussed, prior to the implementation of managed competition, the agencies experienced the loss of about 10% (for nursing agencies) to 20% (for PSW agencies) of their workforce, owing to the impact of other variables on turnover such as retirement, return to school, family reasons, low pay, reductions in government funding of hospital care and so on (Abelson et al. 2004). However, turnover increased dramatically when agencies lost contracts because their tenders were unsuccessful.

Second, the marketization of home care led to an intensification and causalization of work, and to lower pay, poorer benefits and less job security (Denton et al. 2003). These changes were reflected in the reasons given by home care workers for leaving their agencies. We conclude that part of the increase in the proportion of nurses and PSWs leaving their agencies was a result of lost contracts, loss of volume and changes in working conditions brought on by the marketization of home care. Other factors, such as the strike by nurses in Agency 1 that was a byproduct of managed competition, also contributed to the increase.

In 2001, nurses in hospitals made over $4 an hour more than home care nurses and had better benefits (Denton et al. 2003). It is no wonder that nurses left to find work in the hospital sector. Although PSWs were also more likely to obtain higher hourly rates in nursing homes (Caplan 2005), they were more likely to find non-healthcare jobs than to find employment in nursing homes. For some PSWs, finding another job in the service, retail or manufacturing sectors that might provide better job conditions was an attractive alternative to working in an unstable home care environment. This shift represents a tremendous loss of skilled and trained staff out of the home and healthcare sectors.

Home care in Ontario is changing from a caring business to a cost-effective, profit-oriented business, with cost efficiency as the bottom line (Baranek et al. 2004). To compete for price, agencies had to keep their fees for service low and shed extra administrative staff. Managers told us that there was very little room in the budget for staff education and training (Denton et al. 2003). This factor had implications for the retention of nursing staff. Our study showed that for some nurses, lack of challenging and educational opportunities were reasons for leaving their agencies. Nearly one-fifth of the nurses moved into positions as case managers and others moved into managerial or supervisory positions, indicating that in order to move up, nurses had to switch employers. Many nurses cited better opportunities to make use of their experience, to acquire skills for advancement and to further their education as important reasons for choosing their subsequent jobs. This finding points to the need for nursing agencies to provide opportunities for education and advancement in their organizations if they wish to retain nursing staff.

Conclusion

In the region where we conducted our study, decisions on how and to whom to give contracts were not initially based on transparent, consistently used standards; instead, they were implicitly led by political views and goals, i.e., to open the market to for-profit agencies (Denton et al. 2003). As we have shown elsewhere, working conditions for staff and, by extension, care for clients were not considered legitimate concerns in issuing contracts (Aronson et al. 2004; Denton et al. 2003). Workers were seen as dispensable factors in the cost structure, and the effects of these deteriorating working conditions on staff turnover were not taken into consideration in issuing contracts. To survive, agencies had to make cuts to their labour costs; but costs were cut to such a level that workers felt they had no option but to leave the agency and, in most cases, the home care sector. In a labour-intensive sector such as healthcare, these factors are important to consider for the survival of the industry and their effect on quality of care provided to clients. In our case, political goals and aims of the government at that time led the agenda, trickling down to decisions over which contracts would be awarded and the bases for making these decisions. The effects on nurses and PSWs were detrimental, as our study showed.

To stop high turnover in home care, governments need to divert sufficient resources to the sector so that jobs may be restructured as full-time employment, with good pay and benefits that match those provided by long-term care institutions and hospitals …

If the goal is to keep nurses and PSWs in home care, and we believe it should be, the findings of our study have implications for public policy and practice. Recommendations for retaining and recruiting visiting workers in home care are often targeted at the agency level with suggestions about organizational arrangements, working conditions, scheduling, the physical setting, opportunities for training and advancement, pay and benefits (Stone 2001; Feldman 1993). But in a competitive environment, where cost is an important factor in determining how contracts are awarded, agencies are reluctant to inflate their budgets to provide better working conditions and terms of employment for fear of losing the contract. To stop high turnover in home care, governments need to divert sufficient resources to the sector so that jobs may be restructured as full-time employment, with good pay and benefits that match those provided by long-term care institutions and hospitals, and continuity in hours, schedules and place of work. Further, the government should standardize wages and benefits and set rates according to the cost of living in each region. If competition based on workers' earnings is taken out of the formulae, then the agencies can compete on other factors such as quality of care. The government should take immediate action on this issue and not allow further deterioration of workers' earnings. As noted by Dawson and Surpin (2000: 228), "treating direct-care workers as not only a scarce, but a valuable, resource is such a dramatic change from industry norms that an effective response will require fundamental, structural changes in both *industry practice* and *public policy*." This change in the very nature of home care work can happen only with a supportive public policy environment that recognizes the inherent benefit to both the clients and the healthcare system of providing healthcare in the home. Because the public sector is the major source of financing for home healthcare, the key to improved financing is what the public sector is willing to pay for home healthcare and the conditions that the public sector sets in its financing arrangements (Caro and Kaffenberger 2001). Managed competition may ensure that home healthcare is being provided at the lowest cost, but at what expense to the client, the home care provider and the home healthcare industry? It is important for policy makers to rethink which aspects of the profit-based manufacturing or competition model can be applied to healthcare and where costs can be cut for efficiency.

Our study took place from 1996 to 2002. Since then, changes have been made to the procurement process through the introduction of a Procurement Policy and Procedure Manual in 2003, the introduction of longer contracts and the reorganization of 43 CCACs to 14 CCACs under the new healthcare regionalization plans of Ontario's Liberal government. Further research needs to monitor the impact of these changes on the turnover of home care workers. Since there is no provincial or national list of home care workers, the provincial associations should consider conducting a survey of their member agencies to support or clarify our findings. Further, it would also be of interest to compare turnover across various procurement models in the various provinces in Canada to determine the impact of home care delivery on issues of turnover and retention.

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Correspondence may be directed to: Dr. Margaret Denton, Director, Gerontological Studies, McMaster University, KTH 226, 1280 Main Street West, Hamilton, ON L8S 4M4; tel: 905-525-9140; fax: 905-525-4198.

NOTES

1. We took care to maintain the privacy of employees: only the authors had access to this database.

2. The five-year turnover rate for nurses and personal support workers was calculated by dividing the number of employees that had left the agencies between 1996 and 2001 by the total number employed in 1996 multiplied by 100.

3. For more on this, see Aronson et al. 2004.

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