What is Direct Evidence-Based Policy-Making? Experience from the Drug Benefits Program for Seniors in British Columbia

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RÉSUMÉ

Depuis 1993, la recherche a de plus en plus influencé l'élaboration des politiques de prestations pharmaceutiques à l'égard des aînés de la Colombie-Britannique. Le paradigme de la «médecine fondée sur les résultats» qui met l'accent sur la prépondérance des faits probants découlant d'une étude sur échantillon aléatoire et contrôlé a dicté aux décideurs principaux leur élaboration des mesures de couverture concernant les nouveaux et les anciens médicaments. Les nouveaux médicaments qui sont plus chers que les médicaments semblables déjà sur le marché ne sont pas couverts, sauf si des études publiées et effectuées sur échantillon aléatoire et contrôlé en démontrent la supériorité. On accorde moins de poids aux preuves indirectes fondées sur des substituts et on tient rarement compte des études non randomisées. On examine séparément les données concernant le rapport coût-efficacité des nouveaux médicaments. Dans le cas des médicaments déjà sur le marché, on a mis en place un nouveau mécanisme de remboursement basé sur le prix (RBP) qui repose sur l'efficacité comparée directe et indirecte des médicaments. La mise en place du RBP a été complexe et nécessairement rapide, ce qui signifie qu'un examen systématique indépendant des mesures de mise en place n'a pu être fait, plus particulièrement en ce qui concerne l'autorisation préalable rapide d'exemptions de RBP. Les écarts entre les méthodes s'appliquant aux nouveaux et aux anciens médicaments nous éclairent sur les difficultés de mise en pratique de l'élaboration de politiques fondées sur la preuve directe.

ABSTRACT

Drug benefits policy-making for seniors in British Columbia has been increasingly influenced by research since 1993. The "evidence-based medicine" paradigm, which emphasizes the primacy of direct evidence from randomized control trials, inspired key policy-makers and influenced policy concerning coverage of new and existing

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drugs. New drugs, if more expensive than existing similar drugs, are not covered unless published randomized control trials show superior effectiveness. Indirect evidence of effectiveness, based on surrogates, is given less weight, and non-randomized studies are rarely considered. Evidence of cost-effectiveness of new drugs is reviewed separately. For existing drugs, a new reimbursement policy, Reference Based Pricing (RBP), was introduced, based on both direct and indirect evidence of comparative effectiveness of drugs. Implementation of RBP was complex and necessarily rapid, which meant that independent systematic review of evidence relevant to implementation issues was infeasible, particularly in regard to rapid prior authorization of exemptions to RBP. Contrasts between the processes for new and existing drugs provide insights into the difficulties of applying the idea of direct evidence-based policy-making in practice.

For many people, aging brings greater use of prescription medications. This has both health, psychosocial and economic consequences, much of which has been documented by research. What bridging of research and drug benefits policy for seniors has occurred in Canada, and how can bridging be improved? The experience in British Columbia in the period 1993–1996 provides some insights.

The key policy issue for drug benefits programs around the world, as in British Columbia, is the need to curtail double digit annual growth in costs, while improving or at least maintaining health outcomes and causing no increases in other health care costs. In an interview study of managers of 48 Medicaid drug benefits programs in the United States, Soumerai et al.[1] found that, among the 19 states which had made changes in cost-sharing policy, only one-quarter had used published research on the effects of cost-sharing policies to guide policy development. Compared with this discouraging picture, British Columbia is doing well. Since 1993, Pharmacare – the province's publicly funded drug benefits program mainly serving seniors – has increasingly used research in policy decisions. This is particularly interesting because key individuals in the policy process are advocates of "evidence-based medicine,"[2,3] a paradigm which goes beyond "research supported" medicine.

This paper examines the *paradigm* that inspired the *people* who shaped the *policies* that influenced *prescribing*. The paradigm is "evidence-based medicine". The people are Pharmacare's Executive Director, medical advisors, and staff pharmacists, plus several teams of university and hospital physicians and pharmacists. The two areas of policy-making concerned coverage of new drugs and coverage of existing drugs. The prescribing, mainly to seniors, was causing a financial crisis for Pharmacare: total program costs were escalating at 16 per cent per year, mainly due to expensive new copies of existing drugs with no demonstrated additional health benefits.[4,5] Results of this experience are examined here *as if* it had been an experiment: the hypothesis is that the evidence-based medicine paradigm has a favourable impact on policy-making, increasing Pharmacare's ability to control costs without adversely affecting health outcomes and other health service costs.

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1 The Paradigm: Evidence-based Medicine

The term "evidence-based medicine" entered the medical literature in 1991[6] and became established in 1995 when a new journal by that name[7] was launched, containing brief critical reviews of recent clinical and health care research. It refers to a new paradigm for clinical decision-making, which puts greatest emphasis on evidence from scientifically designed experiments in clinical settings ("randomized control trials"), lesser emphasis on nonrandomized ("observational") studies, and least emphasis on unsystematic clinical observations and expert opinions.[2,8,9]

If one accepts the primacy of randomized control trials, one is forced to recognize sometimes subtle but important distinctions between direct and indirect evidence. One of the most common types of indirect evidence is from studies concerning "surrogate endpoints" – proxies for the actual outcome of interest that are more easily measured or manifest earlier.[10] This is illustrated by the following syllogism:

Research showed: Drug X lowers blood pressure.
Research showed: Lowering blood pressure reduces mortality.
Therefore, research supported: Drug X reduces mortality.

In this example, lower blood pressure is the surrogate for the actual outcome of interest, lower mortality from cardiovascular disease. The conclusion that Drug X reduces mortality was supported by indirect evidence but it was not directly tested until after the drug was widely used. Eventually, meta-analysis of randomized control trials showed that Drug X (short acting nifedipine) does not decrease mortality and may in some circumstances increase it.[11]

This apparent anomaly is explained by rewriting the syllogism more accurately as follows:

Research shows: Drug X lowers blood pressure in some people, and has other effects in these and other people.
Research shows: Lowering blood pressure in other people by other methods (which have other effects) reduces mortality.
Therefore: This research provides little basis – no direct evidence – for concluding that Drug X reduces mortality.

Traditional medical education and clinical practice is supported by a vast amount of indirect biomedical evidence. Most medical hypotheses of the form "Cause X will have Effect Y in Person Z" are supported by research on causes which are similar but not identical to X, or which have effects related but not identical to Y (e.g., surrogate endpoints), among people (or animals) that may differ from Person Z in many ways. Only a minority of hypotheses treated as facts in medical education and clinical practice are based on direct evidence of health impacts on representative patients in controlled studies of the actual procedure in clinical settings. If such studies are done, treatments that "ought to work" and seem to work, are often found not to work. In the words of one of Canada's leading proponents of evidence-based medicine, "Clinical medicine seems to consist of a few things we know, a few things we think we know (but probably don't), and lots of things we

don't know at all".[12]

A book called *Modern Medical Mistakes*[13] chronicles dozens of medical procedures that were supported by research or unsystematic observations, but were eventually refuted by direct evidence: surgery for irritable bowel, removal of tonsils, appendixes, and various other organs for "focal infection"; x-ray treatments of infants with enlarged thymuses; new blood supplies to the brain for mental retardation and cerebral palsy; attempts to repair broken bones with glue; treating schizophrenia by putting the patient into coma with insulin; freezing stomachs to treat ulcers; oxygen treatment of premature infants causing blindness; and many drugs which proved toxic. Many other examples can be cited from recent medical literature, often related to overinterpretation of surrogates.[10]

Unfortunately the term "evidence-based medicine" is not concisely defined and is often used indiscriminately. Hereafter, we will use instead the term "direct evidence-based medicine," and define it to mean medical treatment decisions based on results from direct tests of the treatment hypothesis in similar patients in scientifically controlled studies.

The same distinction between direct and indirect evidence applies when hospitals, health ministries and governments make policy decisions to intervene with advisories, procedures, rules, or reimbursements, as well as decisions not to intervene. Many such policy decisions presumably result in interventions that "ought to work" (according to indirect evidence) and seem to be working, but if directly tested scientifically, would be found not to work. The opposite holds: direct evidence would also show that many policy decisions result in effective interventions, although critics may cite indirect research suggesting that the interventions are harmful.

The contrast between the old paradigm and the new paradigm in the realm of policy is illustrated by the following syllogisms:

Our data show: Policy X reduced financial pressure on Pharmacare.

Our data show: Reduced financial pressure enabled Pharmacare to cover a new drug that improves health outcomes.

Therefore: Policy X saved money and improved health outcomes.

This syllogism should be rewritten more accurately as follows:

Research shows: Paying only for generic drugs reduced financial pressure on Pharmacare, and increased emotional pressure on some patients who believe (contrary to available scientific evidence) that switching to generics had adverse effects.

Research shows: Reduced financial pressure enabled Pharmacare to cover a new drug that improves health outcomes in some people but may have no effect, perhaps adverse effects, in other types of people not included in scientific studies.

Therefore: To conclude that Policy X – paying for generic drugs in preference to brand name drugs – improved health outcomes, it is necessary to directly evaluate the health impacts of the generic drugs policy and the new drug in this population.

The purpose of this paper is to elucidate characteristics of "direct evi-

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dence-based policy-making". The definition of "policy" used here is a decision by government concerning a repeated intervention. This sense is closely analogous to an individual physician's "personal policy" to treat certain types of patient with certain treatments. One-time-only decisions, in which no ongoing policy is intended, are not considered in this paper; nor are policy proposals or statements of intent where decisions regarding implementation are never reached.

2 The People: Pharmacare and Its Advisors

In 1993, Pharmacare faced a budget crisis, with expenditures escalating at a rate of 16 per cent per year. An external Pharmacare Review Panel was commissioned to consult the public, including experts, and to make recommendations to the British Columbia Minister of Health. Review of medical literature was not part of its mandate, and its final report included no references. The Panel's approach was more in keeping with the old paradigm than the new.

In November 1993, a new Executive Director of Pharmacare was appointed, who embraced the new paradigm. One of his first acts was to request a review of literature on the effects and side-effects of drug benefits policies. This led to the work of Soumerai et al.,[14] which sensitized Pharmacare to the potential for drug policy side effects.

New Drugs. In April 1994, Pharmacare laid the cornerstone of its evidence-based policy making process when it contracted with the Department of Pharmacology and Therapeutics at the University of British Columbia to establish the Therapeutics Initiative (TI). The leading members of the TI were all advocates of evidence-based medicine. The TI was to be an independent body of clinicians and researchers who would review the scientific evidence on the comparative effectiveness of new and existing drugs.

The key words are "comparative effectiveness". The main question of interest to Pharmacare was not "Does research support the effectiveness of this new drug relative to a *placebo*?" but "Is there direct evidence that this new drug is more effective than *existing drugs*?". The answer was directly relevant to the actual policy decision: "Should Pharmacare pay for this new drug, given that similar less expensive drugs exist and are as effective?".

The TI first assessed whether a drug was a "new entity". If it had the same mechanism of action for a specific indication as an existing drug, it was not new. Most new drug products are not new entities. In the case of a new entity, the TI answered the question whether there existed "evidence of a therapeutic advantage" on the basis of at least one randomized control trial comparing the new drug to an existing drug. The onus was on the drug company to furnish the relevant scientific evidence. The TI made no funding recommendations. It just reviewed evidence and disseminated its findings, like an office for health technology assessment.

In 1996, another committee was established, to review the evidence of cost-effectiveness of new drugs that the TI judged were new entities or had

therapeutic advantages. Called the Pharmacoeconomics Initiative (PI), it was chaired by a university hospital-based pharmacoeconomist, partially supported by a contract from Pharmacare. Members included an epidemiologist, pharmacists, physicians, health economists and others. Those from universities were appointed by Pharmacare. Those from professional associations were selected by their organizations. Only one Pharmacare employee was on the committee. Most of the evidence they reviewed was very indirect, because randomized control trials only rarely include detailed data on economic outcomes in the treatment and control groups. The PI's main source of evidence was drug company pharmacoeconomic analyses showing cost-effectiveness of their new products. The PI reviewed these documents (and additional literature as needed) and answered the question "Is new Drug B cost-effective relative to existing Drug A?".

Existing Drugs. In early 1995, Pharmacare first considered reference pricing, a policy developed in Germany and used in New Zealand, Denmark and the Netherlands. Briefly, it is a policy to pay similar amounts (purchase prices or reimbursements) for drugs with similar effects. Information on New Zealand's experience was obtained by personal communications with the Deputy Minister of Health of New Zealand who had recently been seconded to New Zealand from the B.C. Ministry of Health. Through personal contacts with Europeans, indirectly relevant data were found suggesting that reference pricing in Germany and other European countries stemmed cost escalation within drug categories.[15] Based on this, and direct evidence concerning comparative drug effectiveness and costs (summarized by the Therapeutics Initiative in newsletters previously sent to B.C. doctors), in May 1995 Pharmacare proposed to Cabinet a version of the policy that it called Reference *Based* Pricing (RBP).

In October and November, RBP was applied to certain stomach acid suppression drugs, nitrates used for heart pain, and nonsteroidal anti-inflammatory drugs (NSAIDs) mainly used for arthritis. The basis in evidence was similar to the policy for new drugs: if there was no scientific evidence that expensive drugs in the same therapeutic class had additional health benefits, then there was no basis for reimbursement beyond the price of one of the cheaper, presumably equally effective drugs (known as the "reference" drug). Pharmacare summarized some of this evidence in its mailing to physicians, and included a copy of an American College of Physicians (ACP) Journal Club summary[16] of a review of evidence showing no difference in frequency of central nervous system side-effects of the two most common stomach acid suppression drugs, ranitidine and cimetidine, the latter which was to be the "reference drug".

Before Cabinet had reached a decision, the Pharmaceutical Manufacturers Association of Canada (PMAC) had begun an advertising campaign claiming that RBP would put seniors' health at risk. In the fall of 1995, PMAC and several drug companies launched a legal challenge against RBP claiming that RBP was beyond the statutory authority of the Minister of Health, inconsistent with the *Medicare Protection Act,* the *Food and Drug*

Act, and other legislation, and in violation of the principles of procedural fairness. At the hearing in May 1996, the petitioners presented anecdotal evidence of adverse effects following medication changes, reported by patients to a toll-free telephone. The judge described this evidence as unscientific and concluded that it did not support the conclusion that RBP had a significant negative health impact on patients. The judge ruled against the petition.[17] The petitioners appealed the ruling.

RBP also met opposition from some physicians who said Pharmacare was intruding on their sphere of responsibility and causing them additional paperwork. A B.C. physician criticized the lack of any apparent plan to evaluate RBP's impact on health outcomes.[18] The President of the Canadian Cardiovascular Society criticized other approaches to reference pricing for not taking outcomes into account, which "runs counter to the concept of evidence-based medicine".[19]

Some of the criticisms of RBP would have been more valid if Pharmacare had not simultaneously introduced a parallel policy, "RBP Special Authority," a process for rapid request and approval of exemptions to RBP. Based on clinical information about each patient supplied by the prescribing doctor to Pharmacare's staff pharmacists and physicians by fax or phone, exemptions were granted at an initial rate of about 100 per day (for stomach drugs), increasing to about 400 per day after all three drug classes were affected by the policy. About 98 per cent of requests were approved, most within 24 hours. Key to this rapid approval process was PharmaNet, the new on-line pharmacy data base covering the entire population of the province, accessible from every pharmacy. This enabled each Special Authority approval to be coded directly into the patient's on-line prescription record by a Pharmacare staff pharmacist at the moment of approval.

Immediately after RBP was announced in August 1995, a multidisciplinary brainstorming and troubleshooting committee was announced – the Reference Based Pricing Expert Advisory Committee (RBPEAC). Half the members were independent physicians and pharmacists from universities, hospitals or professional associations, and the other half were Pharmacare staff. The TI decided not to participate, so as to preserve its independence from the policy. RBPEAC included members who advocated evidence-based medicine, but the committee saw itself as supplying timely expert advice, not reviews of evidence concerning specified questions.

One of the first problems addressed by RBPEAC was the creation of an additional Special Authority process to prevent RBP of stomach drugs from backfiring. Pharmacare was told by independent physicians that many physicians would prescribe the expensive drug, omeprazole ($2.30 per day), rather than switch to the inexpensive reference drug, cimetidine ($0.14 per day). Omeprazole was not covered by RBP because it was a "new entity," with a different mechanism of action on the stomach. Therefore Pharmacare ruled that no reimbursement for omeprazole would be given without Special Authority. That decision was implemented within only four weeks, with major modifications at the eleventh hour, which allowed little time for

a direct evidence-based approach.

3 Policy-Making: How Evidence Was Obtained and Used

These two areas of policy initiative – new and existing drugs – were found to differ in how evidence was obtained and used.

New Drugs: In the first area, review of new drugs by the TI, published scientific literature was used most rigorously. The burden was on the drug company to supply evidence. Assessment of the impact of the new drug review process was not done, in part because no impact on health outcomes was expected from not covering drugs when manufacturers were unable to show any health benefit over existing drugs.

Existing Drugs: In the second area – policies concerning existing drugs – Reference Based Pricing was founded primarily, but not exclusively, on the TI's newsletters (The Therapeutics Letter) sent to all prescribing physicians and pharmacists in British Columbia. The newsletter reviews usually could not be as rigorous as the reviews of new drugs because they covered multiple drugs, and because they were intended to educate doctors, not to answer a specified decision-related question. Drug companies were not invited to contribute evidence, because their reviews were expected to be biased.

The Special Authority process for omeprazole – an existing drug – did not conform well with the direct evidence paradigm. Review of literature on omeprazole's effectiveness or cost-effectiveness, relative to other stomach acid drugs, was done internally but not systematically. External viewpoints were obtained by consulting specialists. Independent systematic review of evidence was not considered necessary by Pharmacare, partly because there was too little time and partly because Pharmacare staff could not imagine that a patient truly in need would be denied omeprazole because a physician was unwilling to fill a form for Special Authority. (Pharmacare had decided to approve every request as long as it stated that another gastric acid suppression drug had been tried and failed to relieve symptoms.) Impact assessment of RBP was initiated, using approximate methods. Full detailed impact assessment was discussed as a long term goal.

What accounted for the differences in use of evidence? Factors that seem to have helped or hindered the use of evidence, fall under the following headings:
(a) the stakes and types of decisions, and the consequent time pressures; (b) the choice of structures and processes, and (c) the kinds of tasks and outputs.

(a) Stakes and Types of Decisions
New Drugs: Pharmacare invested much time and money in the TI as a cornerstone of direct evidence-based policy-making because the stakes were high: the major cause of escalating costs for Pharmacare was the price of new drugs. Thorough review of published evidence on a new drug would

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take time (approximately three months) and money, but there was rarely any need to rush or large sums to be saved. Clear evidence-related questions were put to the TI: Is this drug a new entity? If not, is there published evidence from randomized control trials that new Drug B is more effective than existing Drug A? Although the data were sometimes complex, the answers to be given by the TI were simple, repetitive and generally unrushed.

Existing Drugs: RBP and Special Authority involved higher stakes. Potential savings or losses to Pharmacare were in the tens of millions of dollars. There was also a risk of contaminating negotiations between the government and physicians on the much bigger budget for Medical Services. A pre-election political risk arose when PMAC began its advertising campaign against RBP. In a context in which powerful interest groups were voicing wants more than evidence, the final decision on RBP had to be made by the people's political representatives – Cabinet. The time between announcement of the policy and implementation had to be short (five weeks), partly to prevent such side-effects as stockpiling of medications and partly to produce evidence of the soundness of the policy as soon as possible after its announcement, to dispel criticisms.

Although the initial evidence-related question seemed simple – "Should Pharmacare pay for the full price of this drug?" – the answer was not black-or-white, but lay in the grey area of partial reimbursement. Implementation questions were even more varied and complex: "Is there a good reason (or evidence) for believing Procedure A will be more effective than Procedure B for implementing Reference Based Pricing?". Many procedural variations on the policy could be imagined: different drug categories, different price levels, different timing, different exemptions. Moreover, there were numerous administrative decisions – how and when to communicate to physicians and pharmacists, when to allow the PharmaNet computer system's limitations to dictate policy (such as whether the policy would distinguish between new and chronic users of a drug, although the computer could not), whether the Special Authority form would be simple and uniform or complex and tailored to individual drugs, and how physicians would be notified of Special Authority approval. The magnitude and complexity of the omeprazole problem was unanticipated, leaving too little time for independent review of evidence.

(b) Structures and Processes

New Drugs: Much effort was devoted to the design, engineering, critique and re-engineering of the TI's structure and its procedures for drug assessment. This investment in methodology was considered cost-effective because the TIs purpose was clear and its procedures repetitive and unrushed.

Existing Drugs: By contrast, initial implementation of RBP and Special Authority was rapid and complex. Moreover, the responsibilities of the RBPEAC were diverse and evolving.

RBP presented Pharmacare with a "Catch-22" situation: in the case of a

large potentially contentious policy, a structure for bridging research and policy should be created only after the major policy decision has been made. Creation of such a structure is costly and should not be done if the policy is unlikely to be implemented, which is the fate of most policy proposals. The costs are not only financial: creating a structure tells potential critics that the policy is now likely but not yet carefully planned, which is the best time to criticize it. In a climate of partisan criticism, people and organizations are reluctant to participate in policy development. Pharmacare dealt with this Catch-22 by postponing the creation of a structure until Cabinet had approved RBP.

When the Reference Based Pricing Expert Advisory Committee (RBPEAC) first met, only four weeks remained before RBP began. Opportunities were narrow and fleeting for injection of evidence concerning procedures (such as evidence concerning the degree of patient and physician preference of omeprazole over cimetidine, and data on the logistical magnitude of the omeprazole problem). By the same token, faced with a tough deadline, rapid input of expert opinion proved far superior to slow critical review of original evidence. Initially the RBPEAC wasted no time on structure and formalities. Discussions went in many directions as unexpected complications and potential pitfalls were identified and suggestions immediately offered. Decision-making between meetings of the advisory committee continued in this vein – juggling ideas under stressful constraints of time and logistics. Evidence of all kinds, mostly indirect and fragmentary, was injected into discussions, but not in predictable ways and not in response to evidence-related questions.

(c) Tasks and Outputs

New Drugs: The outputs of the TI were written summaries of its reviews of evidence, carefully citing the literature. Some of this evidence was disseminated in The Therapeutics Letter to prescribing physicians and pharmacists across the province. The TI did not make funding recommendations.

Existing Drugs: The written outputs of the RBPEAC, in the early unstructured period of brainstorming and troubleshooting, were notes on a flip chart. Such transient abbreviated ideas are harder to ground in evidence.

When the pace of implementation slowed after several months, the RPBEAC invested in its own structure and processes. Now there was time for thorough documentation, and space on the agenda for discussion of evidence, including the creation of a working group to evaluate the impact of RBP on utilization of other health services, a report on study in progress from a Quebec pharmacoepidemiologist, and findings from the Seniors Drug Focus Project concerning seniors' views about the methods of disseminating information on the policy changes. Nevetheless, tasks and outputs continued to be so varied and complex that the process was more in keeping with the old paradigm of expert opinion-based decision-making, with a large role played by anecdotal information, than the new paradigm of direct evidence-

based decision making.

4 Prescribing: Results of the Initiatives

New Drugs: Unknown sums, probably several millions of dollars, were saved by not covering expensive new drugs lacking evidence of additional benefit. The TI demonstrated its independence from Pharmacare by declining to endorse RBP or assist with it. Pharmacare also demonstrated the independence of the TI in the first year by covering one drug despite the TI's judgement that there was no evidence of a comparative advantage, and not covering another drug despite the TI saying it had some advantage of convenience.

Having based the new drug review process so closely on the scientific literature, little consideration was given to assessing its impact, if any, on health outcomes or medical costs. Pharmacare and the TI believed that if the manufacturer of a new drug could show no evidence of a comparative advantage, there probably was none. Not paying for the drug should therefore have no health impact. By the same token, when the TI decided that the scientific evidence showed a new drug had a comparative advantage, and the PI judged the drug would probably be cost-effective, Pharmacare had no interest in seeking evidence that the newly approved drug would improve outcomes or lower medical costs. Lack of interest was mainly due to shortage of resources for evaluation, but also the realization that, without a randomized control trial, findings from an outcomes study would be inconclusive because of patient selection bias. Impact assessment based on use of another province as a control group would be confounded by other interprovincial differences.

Existing Drugs. Approximately $30 million dollars was saved by the combined policies of RBP and Special Authority during their first year, and this saving was expected to be repeated in subsequent years. Prescribing of cimetidine increased five times, while prescriptions for other gastric drugs in that class decreased over 50 per cent. Omeprazole prescribing decreased by over 40 per cent. Sustained release nitrate prescriptions fell by more than 50 per cent, while prescriptions for the reference nitrate more than tripled. Within a few months, the price of a new nitrate patch had been set low enough to be fully reimbursable. Prescribing of less expensive NSAIDs saved over $5 million. Initial analysis of Medical Services data suggested RBP and Special Authority had not increased net visits to physicians.

5 What is Direct Evidence-Based Policy-Making in Practice?

For Pharmacare's policy-makers, the experience in the period 1994–1996 was a series of challenging initiatives, constrained by multiple practical demands and obstacles. It was far from a designed experiment. For a start, there was no control group of drug policy-makers in another jurisdiction studied concurrently. However, viewing the experience in retrospect *as if* it

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were an experiment, clarifies our study question: What would have happened without the direct evidence paradigm in British Columbia? We speculate that:

1. *The TI and PI would not have been created.*
2. *Pharmacare's credibility would have been lower.*
3. *Impact assessments of RBP might not have been done as thoroughly.*
4. *Perhaps resistance to RBP would have been greater and savings lower.*

These "results" of the experiment suggest to us that the paradigm made a favourable difference. Perhaps equally important, however, was our finding that, even when leading policy-makers are inspired by evidence-based medicine and the government's financial goals are in harmony with a direct evidence-based approach, the ideal is still very difficult to put into practice. Both areas of initiative were less than ideally evidence-based in one way or another:

New Drugs. When a TI review concluded that Drug A was superior to Drug B, its judgement was based on randomized control trials that seldom included many seniors and usually excluded people with multiple illnesses and medications. Pharmacare still had to make a leap of faith: that the TI's conclusion was relevant to Pharmacare clients, most of whom are seniors on multiple medications. To obtain evidence more directly relevant to Pharmacare's decisions, it would be necessary to conduct randomized control trials of new versus existing drugs in unselected groups of seniors.

Existing Drugs. The combination of RBP and Special Authority was an example of policy supported by research but, according to the strict definition above, not yet based on direct evidence. Evidence about the impacts of RBP abroad, if it had existed, would not have been directly applicable, because in those countries there was nothing comparable to B.C.'s rapid Special Authority and Canada's system of drug price regulation. RBP and Special Authority may gain recognition as being direct evidence-based when ongoing evaluation of its actual impacts on health care utilization are completed, following the example of the study showing no adverse effects on health service utilization after an analogous policy on NSAIDs (generic substitution) was introduced in Tennessee.[20]

However, even a detailed evaluation using controlled time series analyses cannot achieve the highest ideal of evidence-based medicine. To equal the ideal, policies such as RBP should be implemented with a randomized control group and statistically analysed with the rigour of a randomized control trial. One approach would be to announce that all people with Personal Health Numbers ending in 7 (or another digit chosen by lottery) are eligible to continue under the old reimbursement rules for one more year. We are now evaluating the feasibility of this for future phases of RBP, by consulting experts and surveying seniors and general practitioners. This can be considered a fifth finding of the experiment:

5. *Without the direct evidence paradigm, no time would have been given to considering a randomized control group to test future RBP policy.*

Direct evidence-based policy-making, like direct evidence-based medi-

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cine, is a paradigm, not a code of conduct. Its defining characteristics will emerge as more proponents employ the paradigm in practice and more studies like this are done. Our interpretation presented here is illustrative, not definitive. In our view, direct evidence-based policy-making shares many similarities with the "outcomes movement" in health policy. The main difference is found in the criteria for the quality of evidence. Direct evidence-based medicine requires *intervention* studies to be randomized,[9] whereas many people in the "outcomes movement" consider nonrandomized studies of interventions as providing reliable, and therefore direct, evidence.[21]

The direct evidence paradigm is very similar to the philosophy of social policy experimentation articulated in 1969 by Donald T. Campbell in a famous article, "Reforms as experiments".[22] Fine examples of randomized control policy experiments have been done in many areas of social policy:[23] income subsidies, prisoner rehabilitation, television programming, electricity distribution and, recently in British Columbia, job retraining.[24] However, the paradigm shift called for by Campbell involves more than doing social experiments and integrating them into policy making. It involves awakening to the fact that *all reforms are designed experiments, but few are designed to be instructive.* This is hard for reformers to embrace because, to surmount the obstacles to reform, they need the courage that comes from the conviction that results will be good.[25] It is difficult to be doubtful and decisive simultaneously. It is easier for drug policy-makers because drug safety review boards have a long history of rigorously linking experimental evidence and policy. It is a small step from drug *safety* to drug *benefits* policy. Whether the direct evidence paradigm evolves to become synonymous with the reform-is-experiment paradigm, remains to be seen.

6 Conclusions

In many ways, the metaphor of bridge building between research and policy is apt. Bridges must be designed and constructed to fit specific terrain. The Pharmacare experience suggests the following possible "engineering" principles for building sturdier bridges: (1) design the process around a decision-oriented evidence related question, to be asked repeatedly; (2) create an independent multidisciplinary structure to assess the evidence separately from the implementation decision; (3) expose summaries of the evidence to criticism and disseminate them to people affected by the decision.

Traditional opinion-based approaches using mainly indirect evidence, often anecdotal and fragmentary, will always be needed when bridges are hard to build: in emergencies, in complex uncharted territory, in want-based democratic contexts, and in situations where collecting the evidence is considered unethical. As in clinical medicine,[12] most policy decisions will be in the grey area in which uncertainty exceeds evidence. However, direct evidence-based policy-making is increasingly feasible, especially when: (a)

the stakes are high, but the decisions are simple, repetitive, and unrushed; (b) the policy-making structures and processes are tailored to evidence-related questions; (c) their tasks are not too varied, complex or vague; and (d) their outputs are written, exposed to criticism, and disseminated to stakeholders.

The ideal approach to direct evidence-based policy-making, however, is inconsistent with the bridge metaphor. No bridge is needed when reform *is* experiment. The gap to be bridged is gone.

Our case study provides indirect support for the hypothesis that the direct evidence paradigm makes a favourable difference to policy processes and outputs, and probably to outcomes. Of course, our data would be ranked lowest in quality by the standards of evidence-based medicine.[8] The challenge for us now is to design studies that directly test the utility of direct evidence-based policy-making and the feasibility of randomized control policy trials.

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