

Who is Bearing the Cost?

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Introduction

Last year we reported on the cost of cancer drugs in Canada. We identified that a small number of new oral take home agents accounted for a large proportion of increasing expenditures which were being met by both public payers and private insurers¹. We noted that Western Canadian provinces had more comprehensive public funding for these drugs than provinces east of the Manitoba border. The latter were relying more heavily on a combination of private insurers and pharmaceutical company compassionate access/assistance programs². If you had cancer, where you lived in Canada determined if the drug was available to you, and whether you had to rely on private insurance or pay for it yourself.

In this follow-up study we investigate the expenditures in the years 2002 to 2007 in each province for a more comprehensive list of oral take home cancer drugs (THCD). We calculate the proportion of costs allocated to THCD in the cancer drug budget of British Columbia, the province providing the best access to new cancer drugs and with the most comprehensive provincial data for cancer drug utilization. Using this proportion, we estimate the total national expenditure which would be required for **all** (both intravenous and oral) cancer drugs by public payers and private insurance companies in 2007, to achieve the level of access and utilization in BC.

Again, this study was made possible by the generous provision of the Brogan Inc. claims databases by Brogan Inc. as well individual provincial data by the BC Cancer Agency, Alberta Health Services – Alberta Cancer Board, Saskatchewan Cancer Agency, Newfoundland Cancer Treatment and Research Foundation, and Newfoundland and Labrador Ministry of Health.

METHODOLOGY

The Brogan Inc. Claims Databases

The Brogan Inc. claims databases capture most of the THCD provided by private insurers and public plans

(i.e., provincial pharmacare plans) in most provinces except public plan data for BC, Alberta, Saskatchewan and PEI. They did not include public expenditures in Newfoundland for the year 2007.

• The Brogan Inc. Private Drug Plan Database

This database is comprised of pay direct drug benefit claims paid for the THCD by almost all private insurers in Canada, representing approximately 67 per cent of the total private drug plan business. The database in total collects information on more than 10 million (anonymized) claimants with 91 million prescriptions annually. The reported data were extrapolated to represent the complete private market in that province. Self payment by patients for THCD costs were not captured and neither were private insurance co-pays and deductibles born by the patient. These costs born by patients were not included in the present analysis.

• The Brogan Inc. Public Drug Plan Database

This database captures take home drugs provided through provincial pharmacare plans including take home cancer drugs. Most intravenous cancer drugs (those given in hospitals and cancer clinics) are not captured, except for those given in private infusion clinics, representing a small but measurable proportion of cancer drugs. These intravenous, hospital and private infusion clinic administered cancer drugs were excluded from the analysis.

• Expenditures in the Brogan Inc. Databases

The expenditures documented in the Brogan Inc. databases include drug cost plus markup costs which can be composed of a wholesaler markup and retail (pharmacy store) markup. On the private side the markup is unregulated and typically is 10–20 per cent, combined wholesale and retail. On the public side, the pharmacare plan in Ontario mandates the markup at eight per cent for combined wholesale and retail. Other provincial public plans have different markups, usually less than 10 per cent. The markup in Quebec was nine per cent until

June 2007, when it was lowered to seven per cent. Saskatchewan allows a gradual markup: 30 per cent for drug cost up to \$6.30, 15 per cent for drug cost between \$6.31 and \$15.80 and 10 per cent for drug cost of \$15.81 to \$200.00, and a maximum markup of \$20.00 for drug cost over \$200.00.³

Additional Data from Provincial Formularies

Data for publicly administered THCD for BC, Alberta, and Saskatchewan, which were not captured by the Brogan Inc. databases, and data for 2007 for Newfoundland, were kindly provided to us by the respective provincial cancer agency or cancer board, and the Newfoundland and Labrador Ministry of Health. Public data for PEI which has a small population (140,000) were not requested or obtained.

No public payer data were available for PEI. Public payer data for Saskatchewan, obtained from the Saskatchewan Cancer Agency were based on fiscal rather than calendar year but all other public and private data were reported by calendar year, including private payer data for Saskatchewan.

Establishment of THCD List for Analysis

Last year we looked at 24 newer cancer drugs (including both THCD and intravenous hospital administered drugs) for 42 specific cancer indications. This year we searched for all THCD, both old and new. Using several cancer drug formularies, a list was compiled of all approved antineoplastic drugs which have NOC (Notice of Compliance) and are thus commercially available in Canada. From this list the drugs indicated below were excluded, and any previously unidentified drug used for cancer added.

THCD Excluded in the Analysis

Some THCD are used significantly or predominantly for non-cancer indications, as detailed in Table 1. These drugs were excluded from the analysis. Examples included:

- Azathioprine – widely used for organ transplant immunosuppression
- Interferon – commonly used for chronic hepatitis B and C infection
- Methotrexate and cyclophosphamide – used for many auto-immune diseases such as rheumatoid arthritis and systemic lupus

Not shown in the list are all cancer drugs given intravenously, which were excluded from the analysis.

THCD Included in the Analysis

The drugs included were in the following classes:

- oral chemotherapy agents
- hormone therapies

- tyrosine kinase inhibitors (new “targeted therapies”)
- supportive medications used primarily for cancer (antiemetics, bisphosphonates, hematopoietic stimulating factors)
- miscellaneous drugs

Most THCD were oral formulations, but a small number are given by subcutaneous or intramuscular injection.

A final list of 43 THCD was derived, shown in table 2 and by drug classification in figure 1.

Final Calculation of Costs for THCD by Province

Expenditures for the final list of 43 THCD were extracted from the Brogan Inc. public and private payer databases as previously described (1). These claims were then merged with the expenditures made available to us by provincial pharmacare plans and provincial cancer agencies, and the Newfoundland and Labrador Ministry of Health to calculate the total cost of THCD by province.

Calculation of Costs Nationally

Total expenditure in all provinces for THCD was calculated for the most recent year studied (2007) for:

- All drug categories
- Only chemotherapy drugs
- Only hormonal agents
- Only tyrosine kinase inhibitors (the new targeted therapies)
- Only supportive medications
- Miscellaneous drugs
- The top ten THCD by cost

Calculation per Incident Cancer Case

In order to provide a perspective on the relative size of expenditures we related drug cost data to the burden of cancer in each province, by expressing the results as dollars per incident cancer case in each province for each year. The numbers of incident cancer cases were derived from the 2002-2007 issues of *Canadian Cancer Statistics, Table 3, “Estimated New Cancer Cases by Major Cancer Site.”*

Factors that Affect Summary Results of THCD

Several factors determining the total cost for THCD in each province were not adjusted for in this analysis, including:

- inflation
- cost-sharing programs with pharmaceutical manufacturers, e.g., compassionate access
- pharmaceutical manufacturer drug assistance programs
- manufacturer’s rebates (cash or free drug)
- British Columbia rebates were imbedded in the data provided
- Saskatchewan rebates were not imbedded in the data provided

FIGURE 1 **Take home cancer drugs studied, by category (n = 43)**

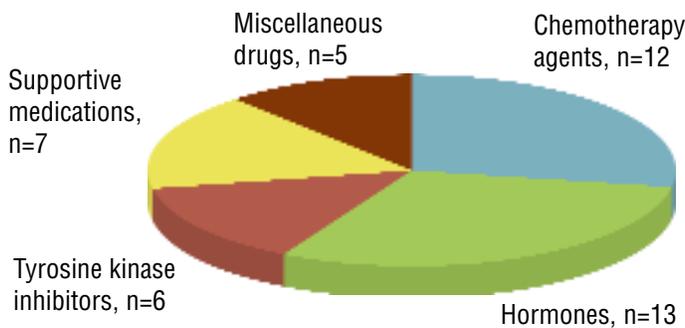


TABLE 1 **Examples of cancer drugs excluded or removed from analysis for THCD**
(significant non-cancer indications or reasons in brackets)

Azathioprine	(Organ transplant immunosuppression, connective tissue disease)
Bromocriptine	(Parkinson disease)
Cabergoline	(Parkinson disease)
Cyclophosphamide	(Connective tissue disorders, SLE, Wegener's, ITP, AIHA)
Cyproterone	(Andropause/ hot flushes)
Erythropoietin	(Anemia of chronic renal failure)
Interferon	(Hepatitis B and C)
Medroxyprogesterone	(Hormone replacement therapy, amenorrhea, irregular or abnormal menses)
Mercaptopurine	(Inflammatory bowel disease and psoriatic arthritis)
Methotrexate	(Psoriasis, rheumatoid arthritis & connective tissue diseases)
Short acting octreotide	(Post surgical/bowel obstruction, diarrhea)
Pamidronate	(Unable to discriminate how much is captured; included in many hospital IV cancer drug budgets)
Topical tretinoin	(Non-cancer skin indications)
Zoledronic acid	(Unable to discriminate how much is captured; included in many hospital IV cancer drug budgets)

TABLE 2 **Final list of THCD (n=43)**

Anagrelide (Agrylin)
Anastrozole (Arimidex)
Aprepitant (Emend)
Bicalutamide (Casodex)
Buserelin (Suprefact)
Busulfan (Myleran)
Capecitabine (Xeloda)
Chlorambucil (Leukeran)
Clodronate (oral only) (Various/generic)
Dasatinib (Sprycel)
Dolasetron (Anzemet)
Erlotinib (Tarceva)
Estramustine (Emcyt)
Etoposide (oral only) (Vepesid)
Exemestane (Aromasin)
Filgrastim (Neupogen)
Fludarabine (oral only) (Fludara)
Flutamide (Various/generic)
Fulvestrant (Faslodex)
Gefitinib (Iressa)
Goserelin (Zoladex)
Granisetron (Kytril)
Hydroxyurea (Various/generic)
Imatinib (Gleevec)
Letrozole (Femara)
Leuprolide (Lupron, Eligard)
Leucovorin (oral only)(Leucovorin)
Levamisole (Ergamisol)
Lomustine (Ceenu)
Megestrol acetate (Various/generic)
Melphalan (Alkeran)
Mitotane (Lysodren)
Nilutamide (Anandron)
Octreotide (long acting formulation only) (Sandostatin LAR)
Ondansetron (Various/generic)
Procarbazine (Matulane)
Sorafenib (Nexavar)
Sunitinib (Sutent)
Tamoxifen (Various/generic)
Temozolomide (Temodal)
Thioguanine (Lanvis)
Thyrotropin (Thyrogen)
Tretinoin (oral only) (Vesanoid)

PUBLIC versus PRIVATE pay, per incident cancer case 2002–2007

PUBLIC ■ **PRIVATE** ■

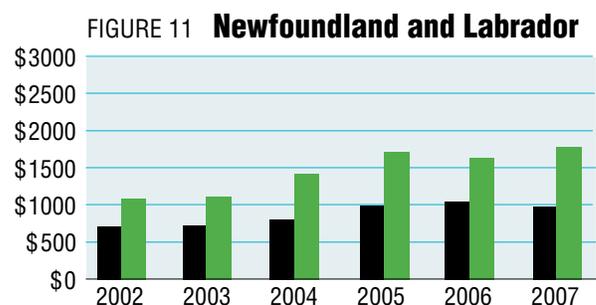
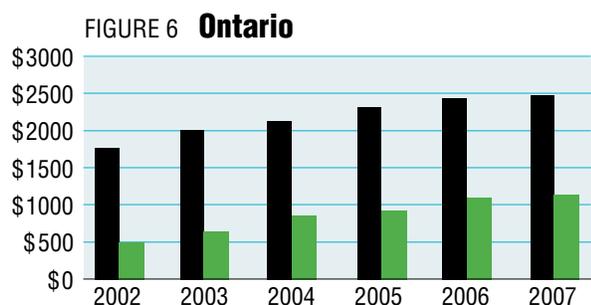
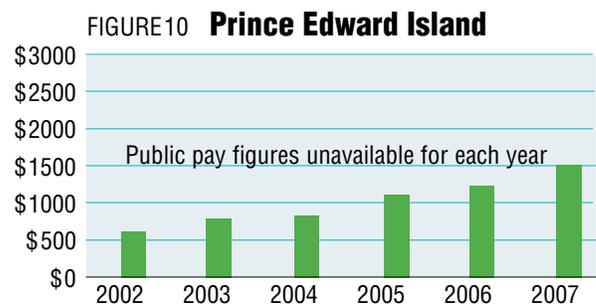
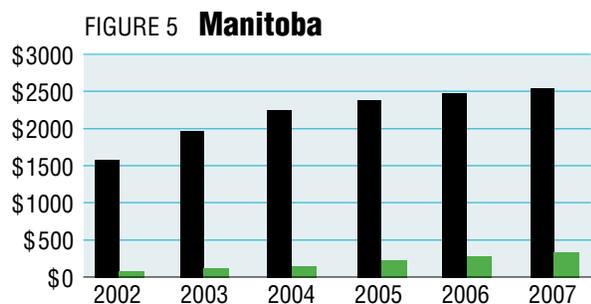
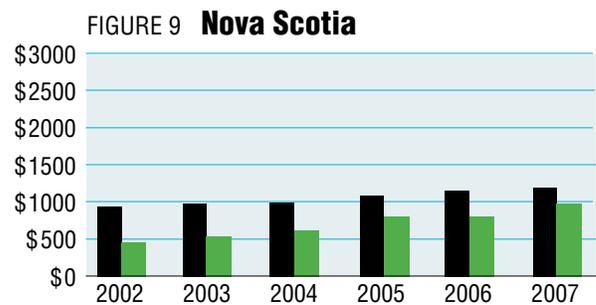
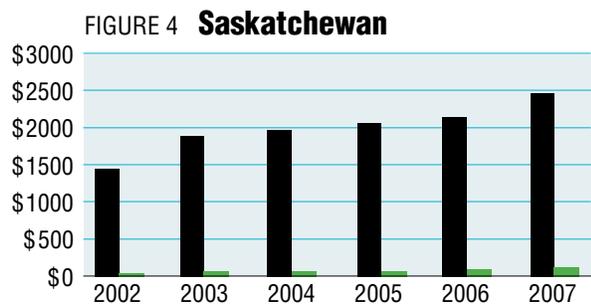
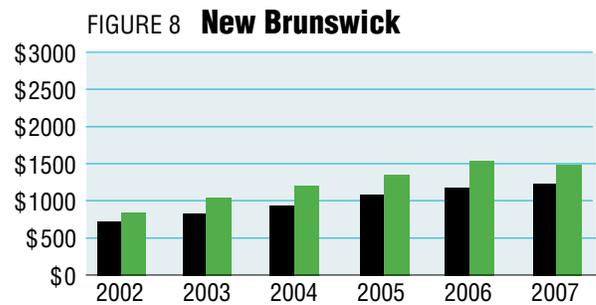
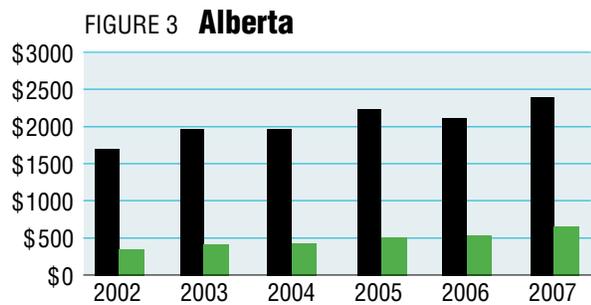
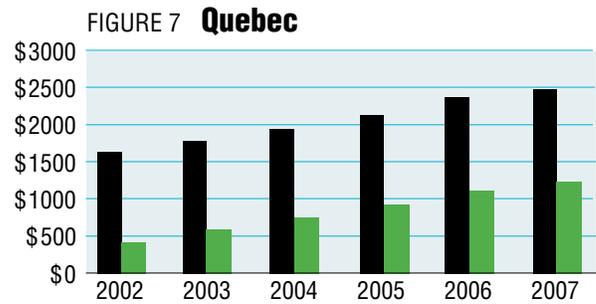
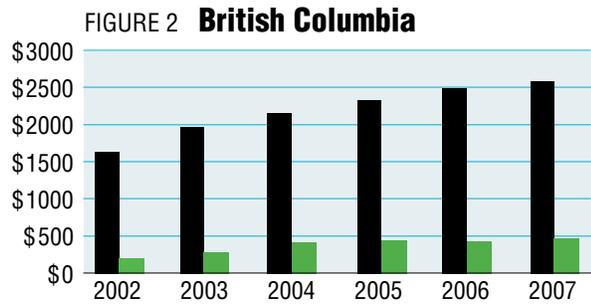


FIGURE 12 **PUBLIC pay for take home cancer drugs in Canadian provinces, % increase 2002 to 2007**

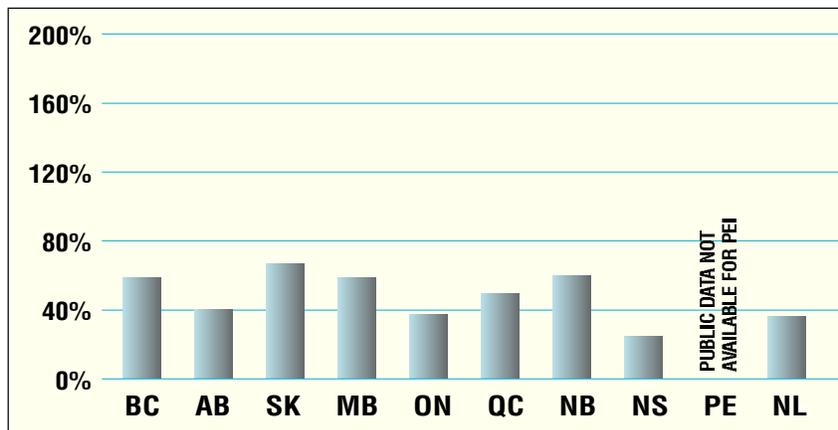


FIGURE 13 **PRIVATE pay for take home cancer drugs in Canadian provinces, % increase 2002 to 2007**

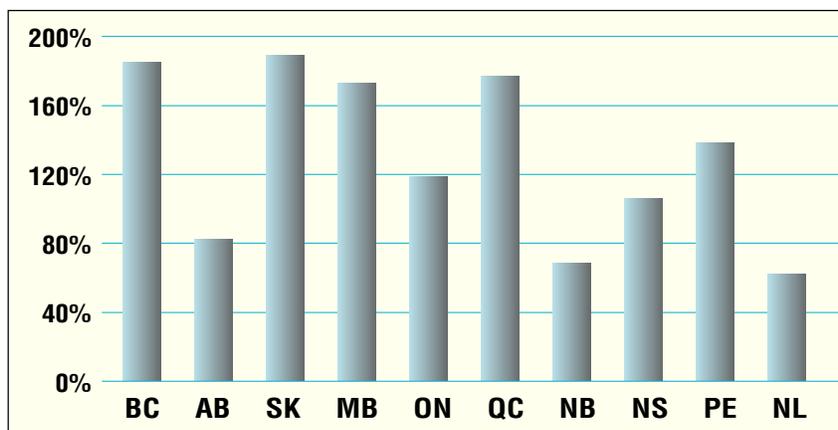


FIGURE 14 **PRIVATE pay for take home cancer drugs in Canadian provinces, per incident cancer case in 2007**

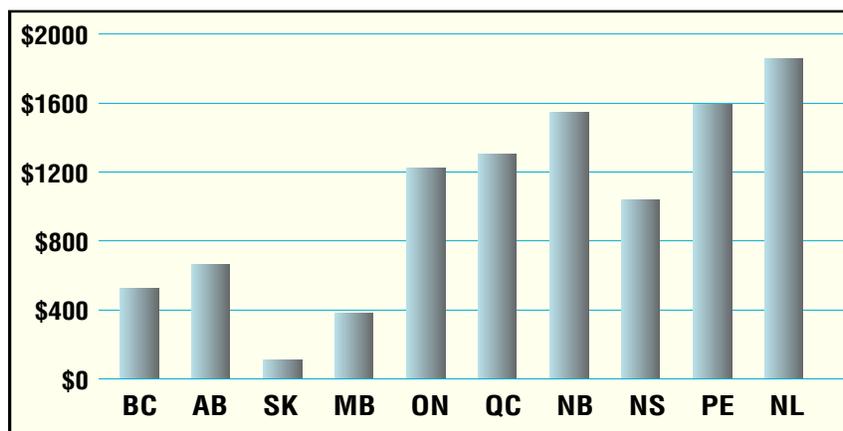


FIGURE 15 **PUBLIC PAY for take home cancer drugs by province**
expressed per incident cancer case for 2002–2007

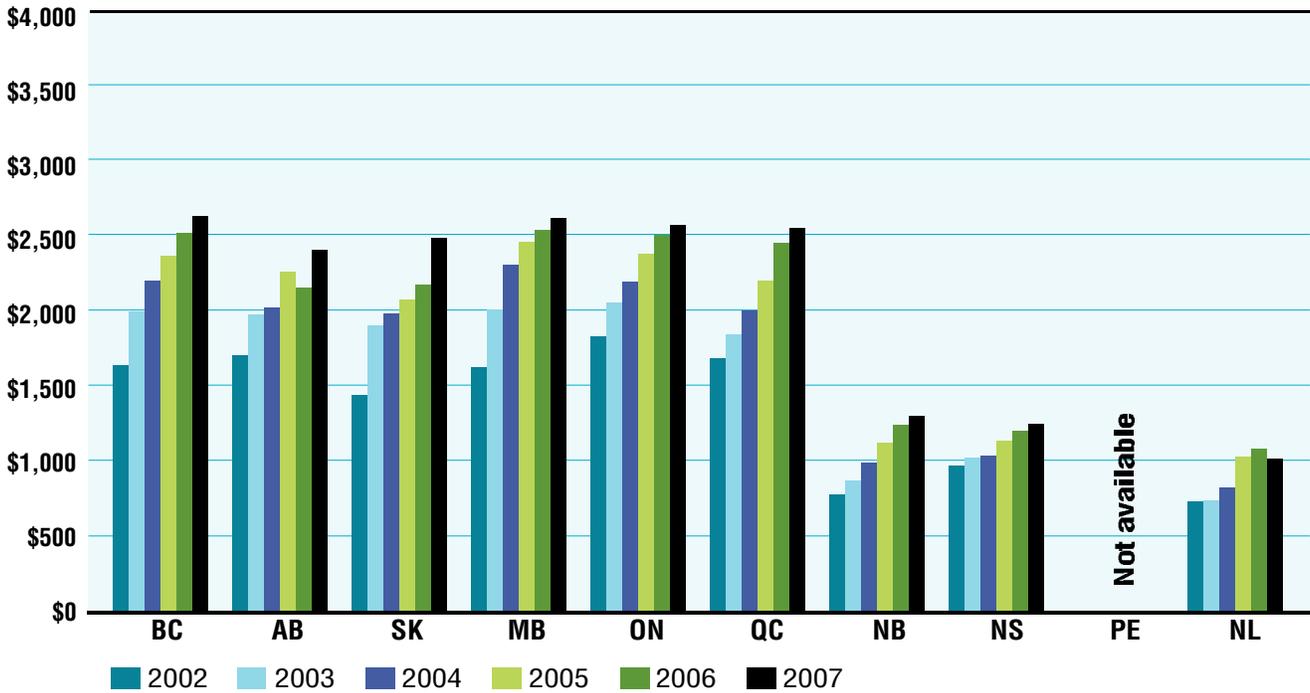
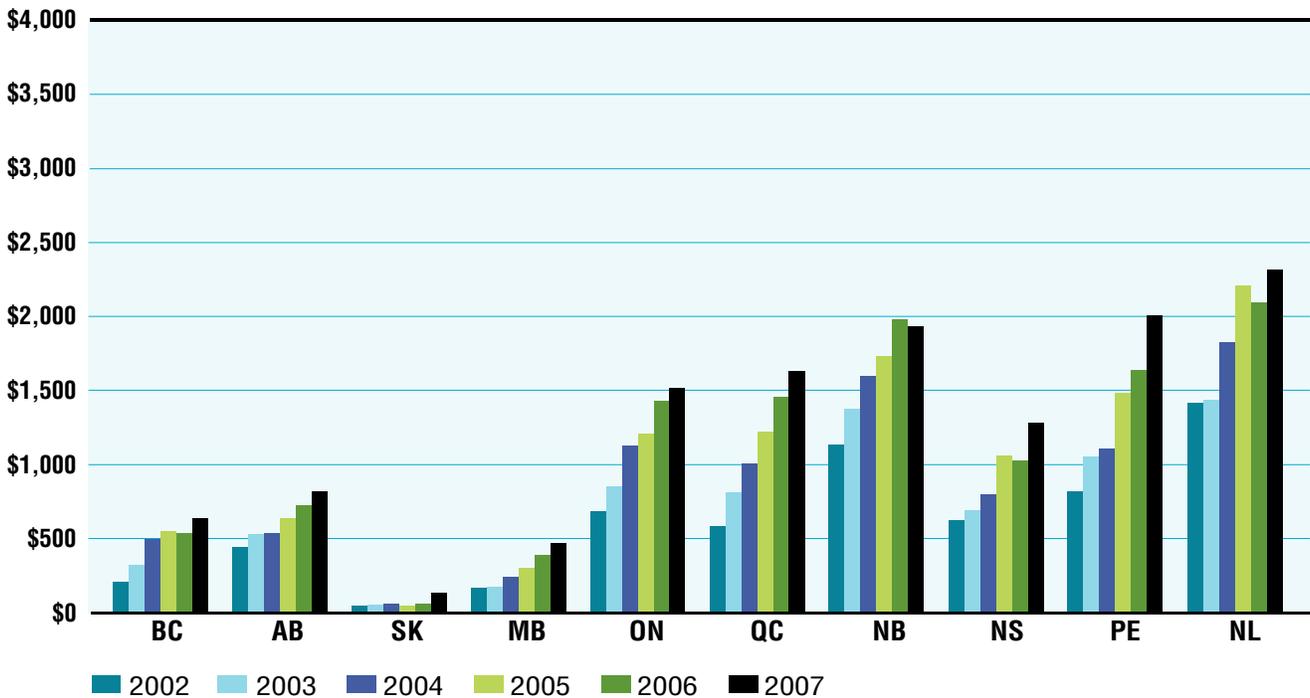


FIGURE 16 **PRIVATE PAY for take home cancer drugs by province**
expressed per incident cancer case for 2002–2007



RESULTS

- **Public and private payer expenditures for THCD by province, expressed per incident cancer case**

Several points emerge as shown in Figures 2 to 11 and Figures 12 to 17.

In the western provinces the proportion paid for THCD by the public system is much higher than by the private insurers. This proportion decreases east of the Manitoba border and by the time the Atlantic Provinces are reached, the ratio of public to private pay is reversed (shown in Figures 2 to 11).

The heavy reliance on private pay for THCD in the Atlantic Provinces dates back to 2002 and in the following 5 years, private pay has been increasing at a faster rate than public pay in every case where data are available (Figures 8 to 11).

Comparing the per cent increases in pay for THCD from 2002 to 2007, in every province the private pay has increased more than public pay (Figures 12 and 13). However, private pay for THCD remains lowest in the western provinces (Figure 14).

The public pay in 2007 for THCD was remarkably constant at \$2500 per estimated incident cancer case for all provinces up to and including Quebec then it dropped sharply to less than half of that in the Atlantic Provinces (Figure 15). Conversely, private pay in 2007 for THCD was generally higher among the Atlantic Provinces (Figure 16).

The total (public plus private) pay for THCD has

increased from 2002 to 2007 in every province for which we have data, with the greatest pay-outs occurring in Ontario and Quebec (Figure 17).

- **Total expenditures in 2007 by drug categories**

The expenditures for THCD in 2007 by drug category are shown in Figure 18, and by drug subcategory as indicated in the headings to Figures 19–23.

The top 10 THCD by expenditure are shown in figure 24. This small number (10 of 43) accounts for over 80 per cent of total expenditures for all THCD studied. Only one drug of the top 10 THCD has a generic formulation.

- **Calculation of the total expenditure for all THCD in Canada**

The total burden of the cost of the 43 take home cancer drugs examined across the 10 provinces amounted to approximately \$555.7 million dollars in 2007.

- **The BC data**

Cancer drugs in BC are provided primarily through the centralized BC Cancer Agency (BCCA) oncology drug budget, while most supportive drugs for cancer such as anti-emetics and filgrastim are provided through the BC Pharmacare plan. The total 2007 expenditure (merged public and private) for the 43 THCD was \$65.4 million. This represented more than half (57 per cent) of the BCCA provincial oncology drug budget (which, in fiscal 2007-2008, was \$114 million dollars) or 50 per cent of the

FIGURE 17 **TOTAL PAY for take home cancer drugs by province expressed per incident cancer case for 2002–2007**

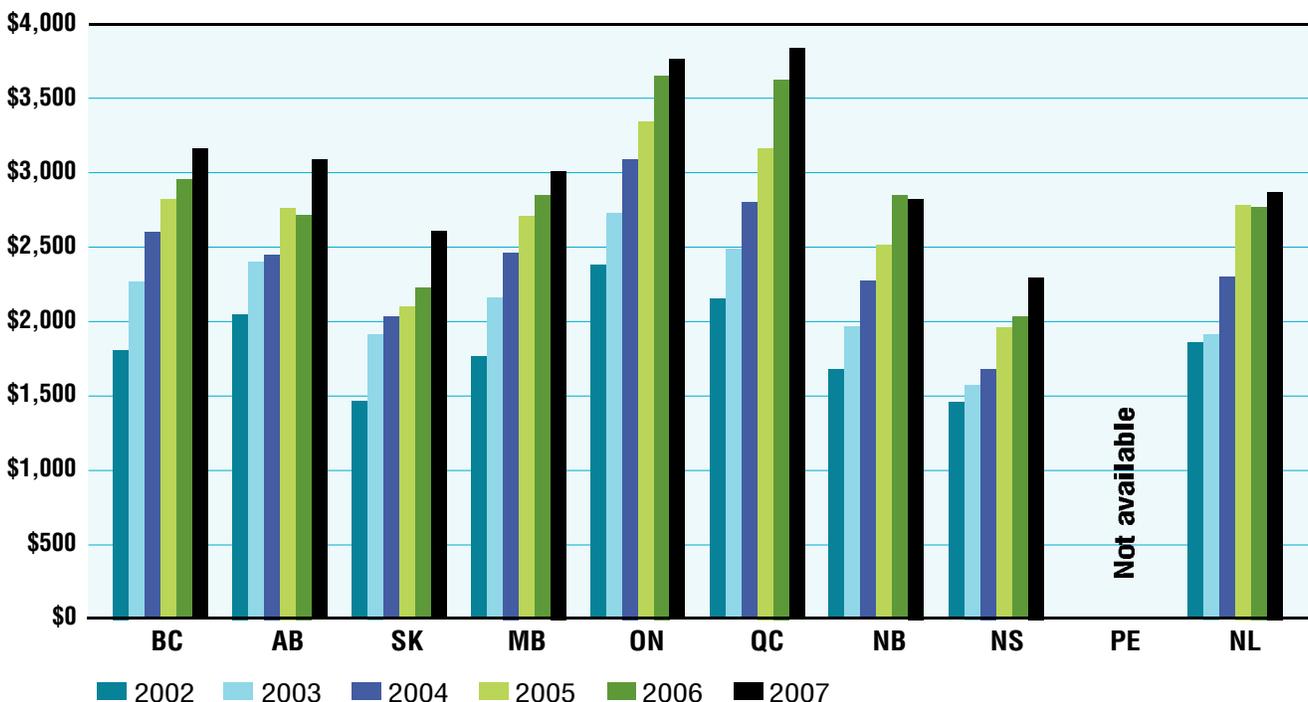


FIGURE 18 **TOTAL pay for take home cancer drugs in 2007 by drug category** (\$ in Millions)

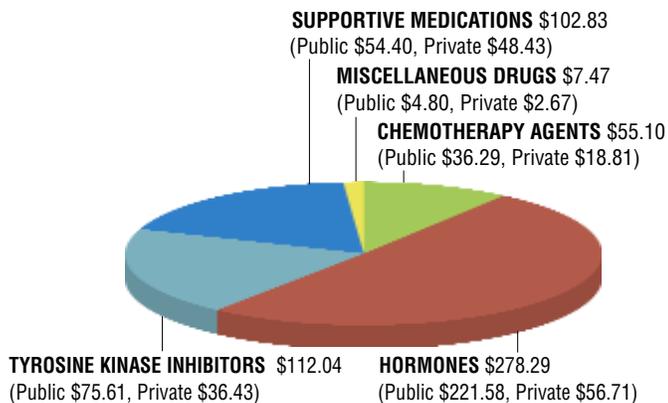


FIGURE 21 **Total pay for take home cancer drugs in 2007 Tyrosine Kinase Inhibitors** (\$ in Millions)

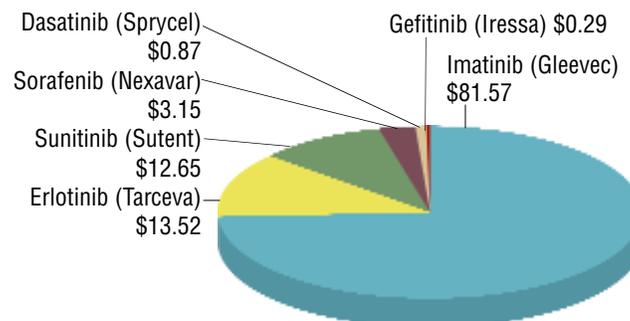


FIGURE 19 **Total pay for take home cancer drugs in 2007 Chemotherapy** (\$ in Millions) *(Various/Generic)

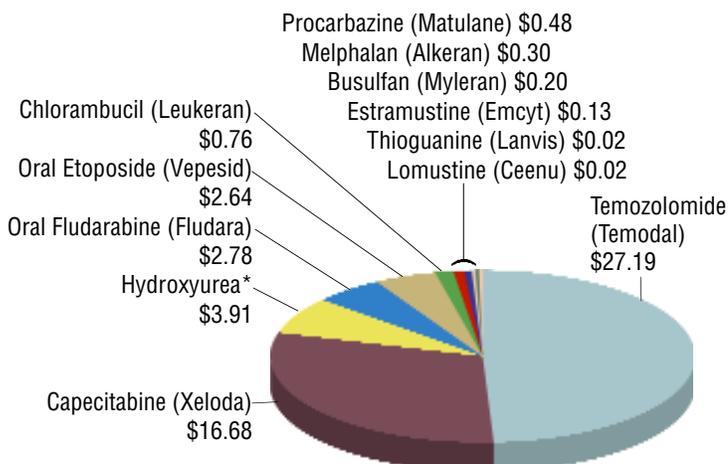


FIGURE 22 **Total pay for take home cancer drugs in 2007 Supportive Medications** (\$ in Millions) *(Various/Generic)

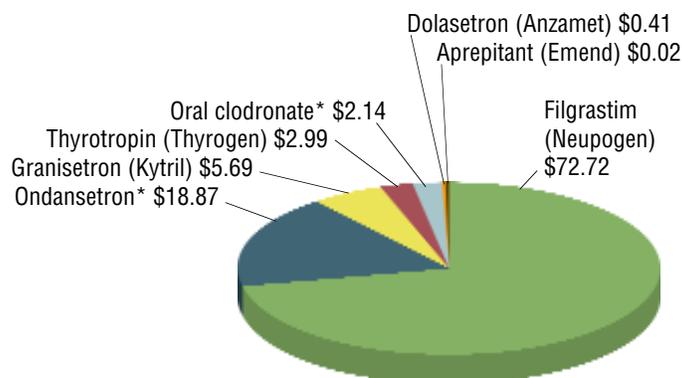


FIGURE 20 **Total pay for take home cancer drugs in 2007 Hormones** (\$ in Millions) *(Various/Generic)

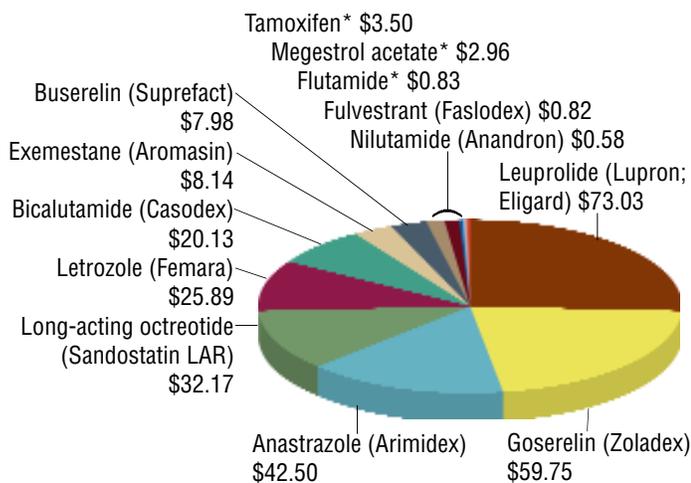
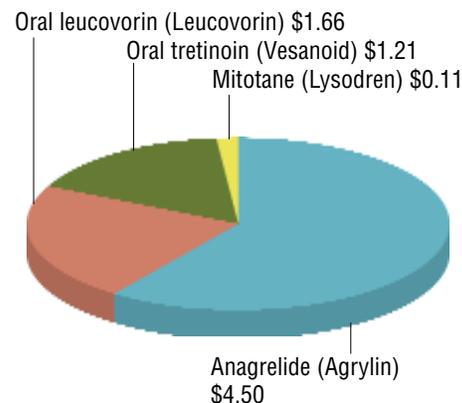


FIGURE 23 **Total pay for take home cancer drugs in 2007 Miscellaneous** (\$ in Millions)



total of all cancer drug expenditures in BC (BCCA oncology drug budget + BC Pharmacare plan claims + private payer claims = \$130 million dollars).

- **Extrapolating from the BC data**

Using the above estimate of the proportion of THCD for BC, we extrapolated the total 2007 THCD drug expenditure of \$555.7 million to all 10 provinces. The extrapolated cost of all cancer drugs (both intravenous and THCD) for the whole country to the level of access and utilization in BC, would have been \$1.1 billion.

DISCUSSION

The results of this study corroborate the findings of the last year's analysis of a limited number of newer intravenous and oral cancer drugs¹. That study was conducted because of the increasing emergence of expensive oral anti-cancer "blockbuster" agents.

In the present study western provinces' public payer systems have again been shown to provide more complete coverage for a more comprehensive list of take home cancer drugs (THCD). As one goes further east, the proportion paid by private payers increases to the point where it becomes preponderant in the Atlantic Provinces. This pattern has been consistent for the six years analyzed 2002–2007. In addition, as indicated in last year's report, the total payout for THCD in the western provinces is consistently higher than in the Atlantic Provinces. The disparities in funding by governments in the eastern provinces will make it more difficult for the evolving Joint Oncology Drug Review to develop a more harmonized approach to address unmet needs for cancer patients.

What has also emerged from the current study is that both public and private payer expenditures are increasing and the increase in private payer expenditures is increasing at a faster rate. Even in BC, which has the best access to public payer funded cancer drugs, private payer expenditure is also increasing.

If this trend continues, it will likely exceed public payer expenditures on a national basis, as has already occurred in the Atlantic Provinces. This shift of funding to the private sector, intended or otherwise by the public health plans, is steadily increasing the burden on employers and individuals who are ill-prepared to deal with these additional costs. Given the cost of the new drugs, access to systemic treatment of cancer is becoming a challenge even when individuals have private health plans because of the co-pays, deductibles and limits to coverage characteristic of many private plans (see *A Primer on Private Health Benefit Plans* in this issue). Apart from Quebec, where supplementary drug insurance is mandatory, private and public insurers have yet to come to grips with what is happening and coordinate their drug coverage plans in the provinces of Canada.

The present study also indicates THCD represent not

only an increasing proportion of costs for all cancer drugs, but a proportion that has reached the neighborhood of 50 per cent.

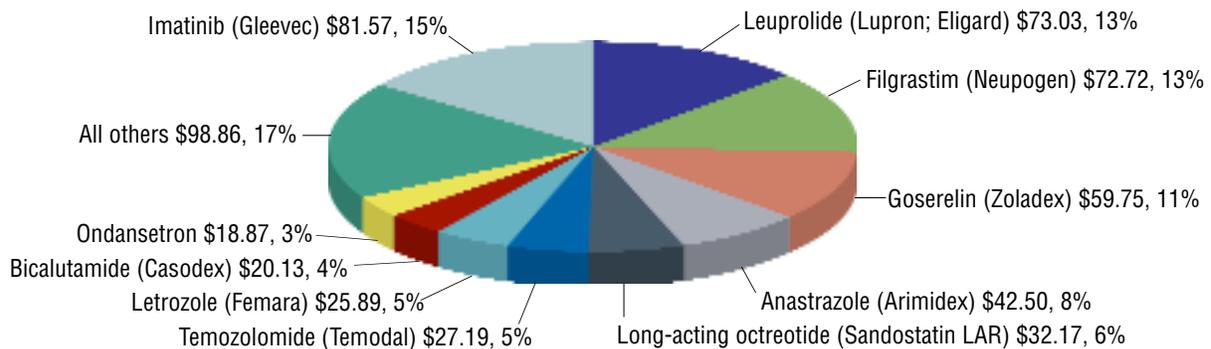
We have found that a small number of newer agents (10 of the 43 THCD examined) accounts for over 80 per cent of the total expenditure on all THCD. Among these is one of the most expensive drugs, Gleevec. This agent has the most dramatic effect, completely reversing the progress of almost all cases of chronic myelogenous leukemia, previously an inevitably fatal condition if bone marrow transplant could not be performed. It is one of the "magic bullets" for which we have all been waiting but has to be taken on an indefinite ongoing basis.

An interesting observation is that the total expenditure for THCD calculated per incident cancer case was lower in the western provinces (BC, Alberta, Saskatchewan, Manitoba), than in Ontario and Quebec (Figure 17). This was contrary to what was expected, as access to cancer drugs in western Canada was previously found to be better than in provinces east of the Manitoba border. Why provinces with more public access should spend less in total than provinces which have lower public access, is unclear. The gate keeping role which may restrict access to expensive new drugs may be a primary reason. British Columbia controls access to many expensive new cancer drugs through a mandatory, online (web based) submission of the key clinical data required to support access to evidence-based treatments. In Alberta, many expensive new drugs are restricted to prescription by a specific Alberta Health Services – Alberta Cancer Board oncologist, based on tumour site. Some provinces may have restricted access to cancer drugs because of shortages of care providers and infrastructure for cancer drug delivery, particularly in more distant, smaller rural or small urban communities (See *Community Oncology* in this issue). An additional factor may be the extent to which markups are allowed to raise costs. The public systems in BC, Alberta and Saskatchewan purchase their THCDs through provincial hospital contracts, thus they leverage best prices, even on single source products, and avoid the markup of retail pharmacies. They dispense through hospital pharmacies, thus further reducing costs to the public purse and the patient.

The total expenditures of \$555.7 million for THCD, seems a very modest sum for such a large group of life threatening diseases causing a significant public health burden in this country, and recognizing that in a few short years, mortality from cancer will exceed heart disease as the predominant cause of death in Canada. The estimated total amount of \$1.1 billion for all drug costs which we have put forward should be compared to what the public systems currently pay for a large number of other drugs (see *Sticker Shock*, at the end of this article). Viewed from this perspective, optimal cancer treatment is affordable.

Gaps in the present data set, particularly in the form of

FIGURE 24 **Top 10 take home cancer drugs by cost, 2007**
(\$ in Millions, % of Total)



variations in rebates from pharmaceutical manufacturers and drug markups in each individual province, probably contribute to some of the differences in inter-provincial figures. However, we feel the data presented herein are a reasonable estimate of costs of the THCD studied. Also, the data within each province from year to year should not be much affected by these variables.

To corroborate our estimate of the total financial cost of cancer drug therapy, a study of the cost of hospital administered (i.e. intravenous) cancer drugs would be needed to supplement the analysis of THCD presented herein. A study of out-of-pocket self-pay (including co-pay) for cancer drugs, as well as pharmaceutical company assistance and compassionate access programs, would complete the picture of cancer drug costs in Canada.

Summary

1. Expenditures on take home cancer drugs (THCD) now represent approximately half of the total for all cancer drugs.
2. An uncoordinated shifting of costs is rapidly occurring from public funding of THCD to private insurers.
3. Employers and insurers should be made aware of the magnitude and pace of these shifts.
4. In western provinces with more comprehensive publicly funded cancer drug programs less is spent in total (public and private expenditures) for THCD than in some eastern provinces with more restricted access.
5. A small proportion of highly effective brand name cancer drugs accounts for the majority of the total expenditures for THCD.
6. Extrapolating from the calculated total THCD expenditure, we estimate the potential cost for all cancer drugs in 2007 to be \$1.1 billion to reach the level of access and utilization in BC.

Recommendations

There is a pressing need for:

1. A national forum to be held of all stakeholders involved in cancer drug provision including public payers, private payers, patient groups, and drug manufacturers, to deal with rising costs of and variable methods of payment for emerging cancer drugs. Broader sharing of the risk pool is urgently required if individual cancer patients are to be shielded from catastrophic financial burdens just at the time they are literally fighting for their lives.
2. A program focused on improving cancer drug coverage in the Atlantic Provinces, where access is the lowest and cancer mortality the highest.
3. A systematic educational program aimed at employers to make them aware of the size of the cost burden for cancer drugs which they will soon be expected to carry.

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Colleen Savage is a public affairs and communications consultant who serves as CEO to the CACC.

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