

## The Cost of Cancer Drugs in Canada

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### INTRODUCTION

In past CACC Report Cards, we have investigated the west-east gradient in cancer mortality in Canada and observed the high degree of correlation between mortality and governmental spending on provincial cancer control programs across the spectrum of prevention, screening, treatment, and supportive care.

In the 2005 and 2006 Report Cards, we also reported on the uneven access to newer cancer drugs across the provinces and noted an increased reciprocal reliance on alternate and less reliable sources of funding particularly in eastern Canadian provinces. However, we remained uncertain as to how the west-east gradient in cancer mortality was related to access to these new and effective cancer drugs.

This year, using a database generously made available to us by Brogan Inc., we studied in more detail the west-east gradient in cancer drug expenditures and sources of payment for them.

### METHODOLOGY

Payments by the public system and private payers were determined in each province for a selected group of the 42 drugs studied in the accompanying article (Drug Access Part III) for the years 2002 to 2006 inclusive. Data were extracted from the claims database at Brogan Inc., which collates drug costs and reimbursements from public drug plans and insurance companies. Information about drug costs paid by provincial cancer agency and cancer clinic budgets is not available in the Brogan database and hence investigation into the total public contributions is limited. In Ontario, Quebec, Manitoba and the Atlantic provinces where significant public data are available, we were able to compare public and private payment for the drugs and years in question. Each drug and year was scrutinized by province to determine which cancer drugs were given in substantial amounts (by number of claims and total value of claims).

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 2002-2006 issues of *Canadian Cancer Statistics, Table 3, "Estimated New Cancer Cases by Major Cancer Site."*

### Description of the Brogan Database

The Brogan Inc. private drug plans database is comprised of pay direct drug benefit claims paid by most major private insurers in Canada. These claims represent 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 record breakdown is as follows: 34 per cent from Ontario, 28 per cent from Quebec, 29 per cent from Western Canada and nine per cent from Eastern Canada. The Brogan database captures between one third (33 per cent for Manitoba) and four fifths (84 per cent for Ontario) of all private insurer drug claims depending on the province. The reported data were extrapolated to represent the complete private market in that province. Patients who self pay for their cancer drugs are not included in the Brogan Inc database, or in the analysis below. It is important to note that many cancer patients pay for their own drugs, or part thereof through either self-pay, a co-payment plan with their insurance company or payment to a hospital where a drug may be administered even if it is not publicly funded.

The 42 cancer drug indications actually represented 24 separate Health Canada approved drugs. These 24 drugs were searched in the Brogan Inc. database. We analyzed the years 2002 to 2006 as data were incomplete for 2007; this represented 23 of the 24 drugs that were approved in 2006 or earlier; the exception was Sprycel which received Health Canada approval only in 2007. Six drugs (Thalomid, Revlimid, Vidaza, Torisel, Targretin, Tykerb) are not yet Health Canada approved, have no designated DIN (Drug Identification Number), and are not commercially available in Canada. The Brogan Inc. database does not include any of these six unapproved drugs.

All 24 searchable drugs were primarily cancer drugs, although a small number have non-cancer indications: mainly Rituxan for rheumatoid arthritis, and various immune cytopenias or disorders, and bisphosphonates (clodronate, pamidronate and Zometa) for osteoporosis and Paget's disease of bone.

The Brogan Inc. public drug plan database includes for the most part, the oral take-home drugs covered by the provincial pharmacare plans including the three aromatase inhibitors (Anastrozole, Femara, Aromasin), the bisphosphonates (clodronate, pamidronate, zoledronic acid), Xeloda, Temodol, Tarceva, and Gleevec. The three aromatase inhibitors, with Xeloda, Temodol, Gleevec and Tarceva represented the seven major drugs both by volume and volume captured. This represented only a minority (30 per cent) of drugs studied (seven of the 23). Public payer claims for newer oral drugs such as Sutent and Nexavar were limited primarily to Quebec and a handful of recent claims in Ontario and were not included in the study.

Although some parenteral drugs are listed in the Brogan public database (Rituxan in three provinces, Campath in one) there were few claims; and some of the Rituxan claims could be for rheumatoid arthritis or non-cancer use. Most of the parenteral cancer drugs studied, Herceptin, Alimta, Oxaliplatin, Avastin, Erbitux, Velcade, Bexxar, Zevalin, Mabcampath (other than one province) were also not listed in the Brogan Inc database. The parenteral drugs are recorded in provincial cancer agency or cancer centre program budgets that were not included in the Brogan database. PEI had no data in the Brogan Inc. database. Saskatchewan only had IV pamidronate listed. Alberta only had the three bisphosphonates listed and no cancer drugs were listed in the public database. Hence

the data below for public claims varies by province and represents a relatively small proportion of the total cancer drug budget for each province..

The Brogan Inc. private drug plan database also included for the most part the oral, take-home cancer drugs; the three aromatase inhibitors, Xeloda, Temodol, Gleevec, Tarceva were the seven drugs captured in the private database. Some of the newer oral drugs such as Sutent and Nexavar had significant number of claims in Ontario, Quebec, Alberta; a small number in New Brunswick, Newfoundland, Nova Scotia, British Columbia; and none in PEI, Saskatchewan or Manitoba. Only a handful of parenteral cancer drugs studied had claims, all of small volume and value of claims including Avastin in Alberta, Saskatchewan, and British Columbia (limited to 2006). Even in the two largest provinces, Ontario and Quebec, private claims for parenteral drugs were restricted to small numbers for Avastin, Erbitux, Campath, and Velcade. Hence most of the Brogan Inc private drug plan claims are for the oral take-home cancer drugs.

In both the Brogan public and private payer databases, parenteral drugs represented only about 10 per cent or less of the total costs of the 23 drugs captured.

In summary, in both the public and private drug plans studied for this article, seven drugs represent the majority expenditure in each province. The seven drugs are the three aromatase inhibitors (Anastrozole, Femara, Aromasin) as well as Xeloda, Temodol, Tarceva, and Gleevec. While these drugs account for the majority of the provincial cancer drug expenditure, it is important to note that the total cancer drug expenditure is but a small proportion of overall provincial drug budgets, i.e., usually less than 10 per cent.

**TABLE 1 PRIVATE PAY FOR CANCER DRUGS IN CANADIAN PROVINCES FOR 2002–2006, EXPRESSED PER ESTIMATED INCIDENT CANCER CASE IN EACH YEAR**

Table 1 shows the private payments for each year from 2002 to 2006 in each province for 23 individual new cancer drugs, expressed relative to the incident cancer cases in each province for each year. Major inter-provincial differences are seen. The private sector is responsible for much less payment per cancer case in the four western Canadian provinces as compared to provinces east of the Manitoba border. Seven drugs (the three aromatase inhibitors, Xeloda, Temodol, Gleevec and Tarceva) account for the majority of the claims and costs shown.

Prov.	2002	2003	2004	2005	2006
BC	\$52.00	\$39.61	\$66.63	\$129.75	\$81.07
AB	\$27.63	\$23.15	\$29.06	\$58.85	\$87.98
SK	\$0.00	\$0.00	\$29.49	\$15.18	\$33.00
MB	\$32.67	\$35.36	\$62.95	\$111.05	\$134.29
ON	\$137.21	\$206.66	\$339.20	\$425.82	\$551.52
QC	\$131.07	\$241.91	\$368.26	\$460.21	\$600.44
NB	\$240.73	\$355.03	\$418.64	\$560.56	\$721.63
NS	\$125.41	\$140.66	\$206.03	\$363.91	\$383.62
PEI	\$93.73	\$246.04	\$323.37	\$527.68	\$684.40
NL	\$171.59	\$238.67	\$386.83	\$478.58	\$456.46

FIGURE 1 PRIVATE PAY FOR CANCER DRUGS IN CANADIAN PROVINCES, 2002 TO 2006

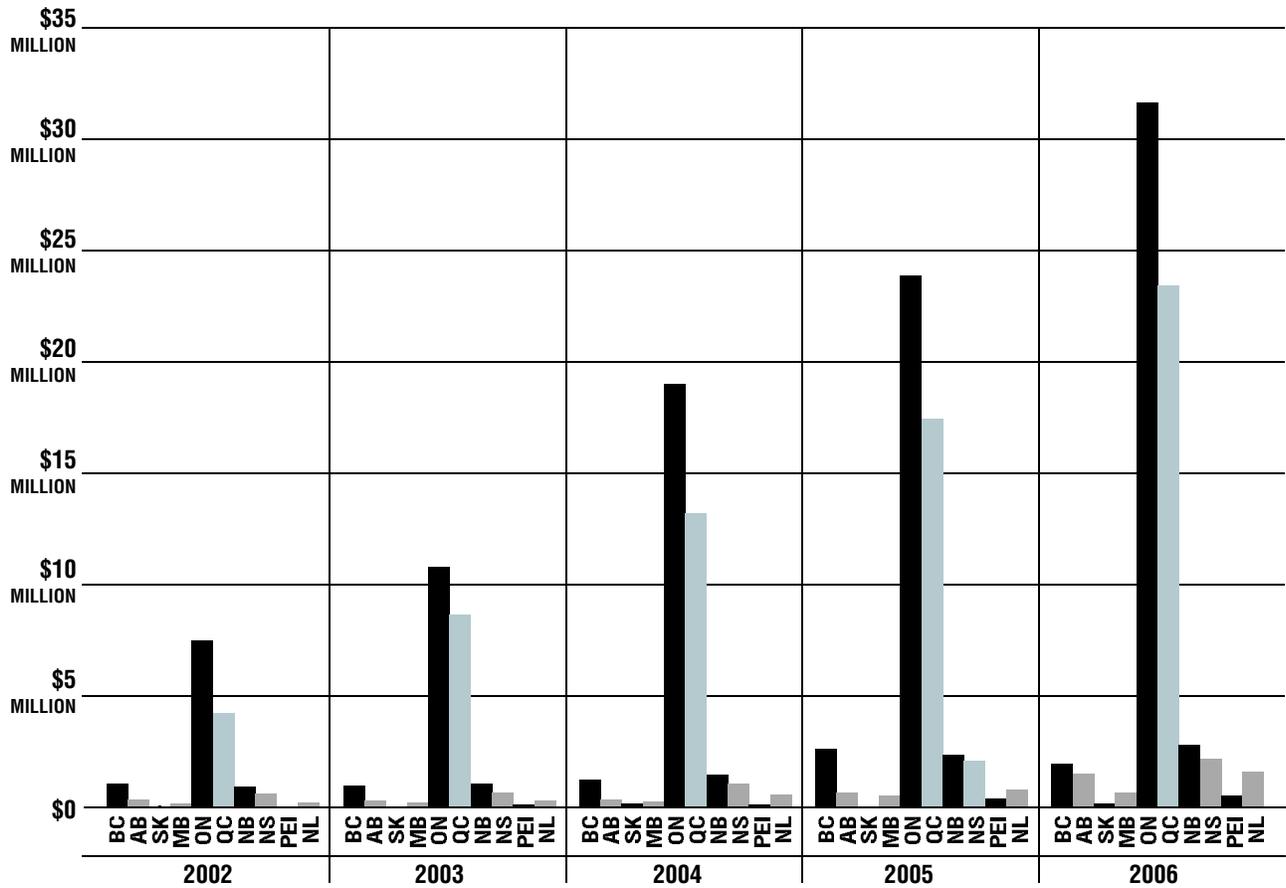
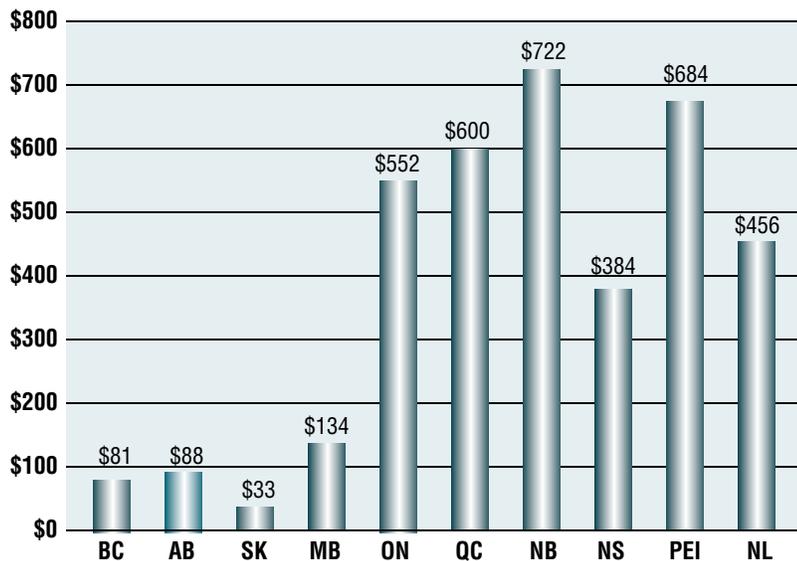


FIGURE 2 PRIVATE PAY IN 2006 FOR CANCER DRUGS IN CANADIAN PROVINCES, EXPRESSED PER ESTIMATED INCIDENT CANCER CASE IN 2006



Estimated New Cancer Cases by Major Cancer Site (Table 3, Canadian Cancer Statistics, 2006, page 24)

Differences between the provinces in terms of private sector contributions in 2006 are depicted graphically in Figure 2. The western provinces spend much less on drugs through private pay mechanisms per incident cancer case than the rest of the country.

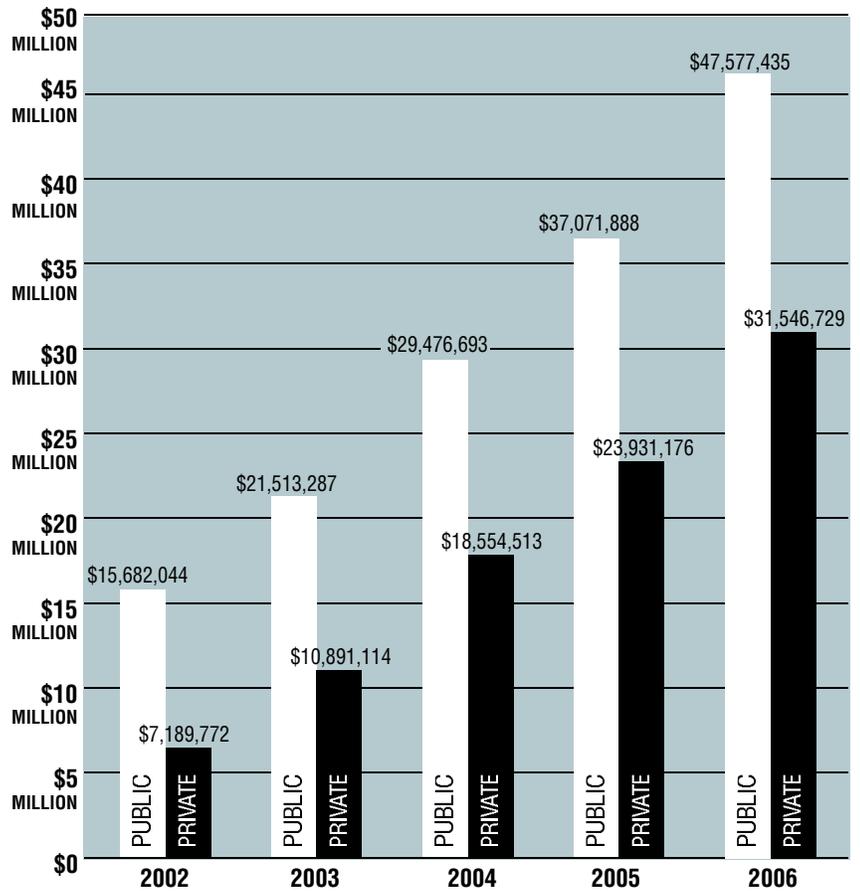
**RESULTS**

Figure 1 shows that, as an increasing number of the 23 drugs became available commercially in Canada from 2002 to 2006, private payouts for these selected cancer drugs increased steadily within each province. The costs shown represent predominantly the seven most common oral take-home drugs described above. A small number of claims for Avastin, Erbitux, Campath, Velcade, Herceptin and Rituxan were seen in specific provinces. The rising contributions from the private drug plan sector in Ontario and Quebec are especially striking. BC was the one exception: total private drug plan costs actually decreased from \$2.5-million in 2005 to \$1.6-million in 2006.

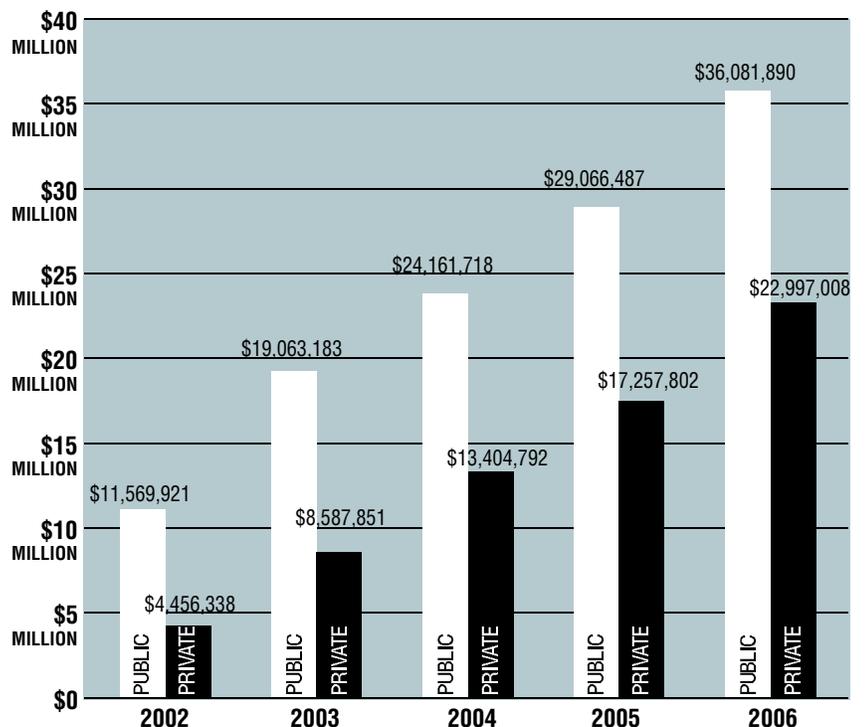
These drugs also were used for indications beyond the 42 specific indications studied including other Health Canada approved indications and off label indications. For example, we only looked at Xeloda on our Drug Access report cards for the Duke C colon cancer indication, but it is also approved in Canada for metastatic breast cancer and metastatic colorectal cancer, alone or in combination with other drugs or radiation, so the data gathered represents use for all these indications collectively. It was not possible to determine if the small number of privately funded parenteral drugs studied were administered in private infusion clinics, or public institutions.

Figures 3 and 4 compare the rising costs of the 23 drugs over the period 2002 to 2006 for both the public and private payers for the provinces of Ontario and Quebec. The main drugs accounting for the majority of these costs are the seven drugs mentioned above, Xeloda, Temodol, Gleevec, Tarceva and the three aromatase inhibitors. While the public systems in these provinces continue to pay a higher portion of the costs especially for these seven drugs, the proportion borne by the private payer sector in each is steadily increasing as well. In Ontario it rose from 31 per cent in 2002 to 40 per cent in 2006 (Figure 3); and in Quebec from 28 per cent in 2002 to 39 per cent in 2006 (Figure 4).

**FIGURE 3 ONTARIO PUBLIC VERSUS PRIVATE PAY 2002–2006**



**FIGURE 4 QUEBEC PUBLIC VERSUS PRIVATE PAY 2002–2006**

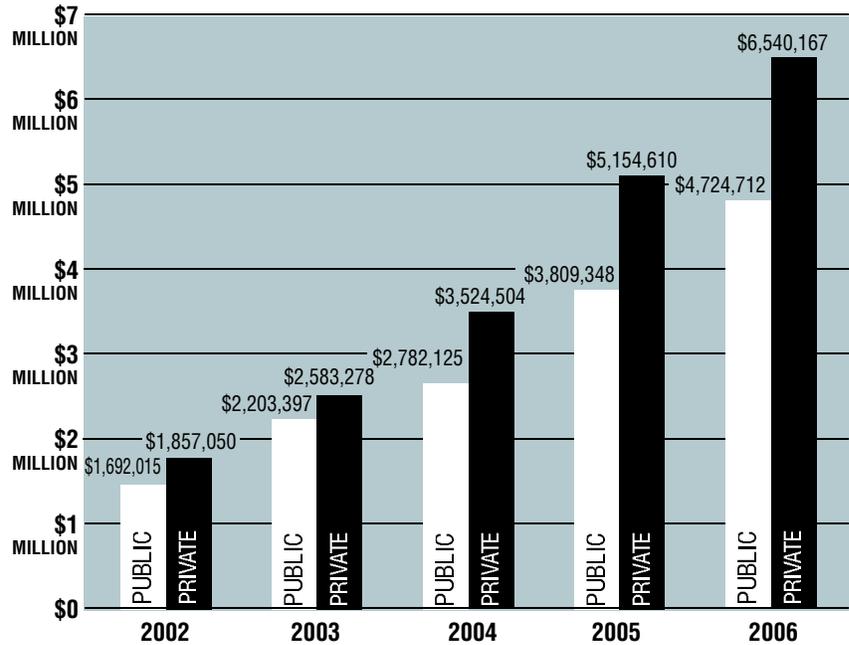


Figures 5 and 6 compare the public and private payer expenditures in two contrasting regions, three Atlantic provinces (New Brunswick, Nova Scotia and Newfoundland) and Manitoba for the 23 drugs. Results are in sharp contrast to the patterns observed in Manitoba, Ontario, Quebec and presumably in BC and Alberta as well. In the Atlantic provinces, private payer expenditures exceed the public provision for take-home oral drugs. Data for PEI are not available.

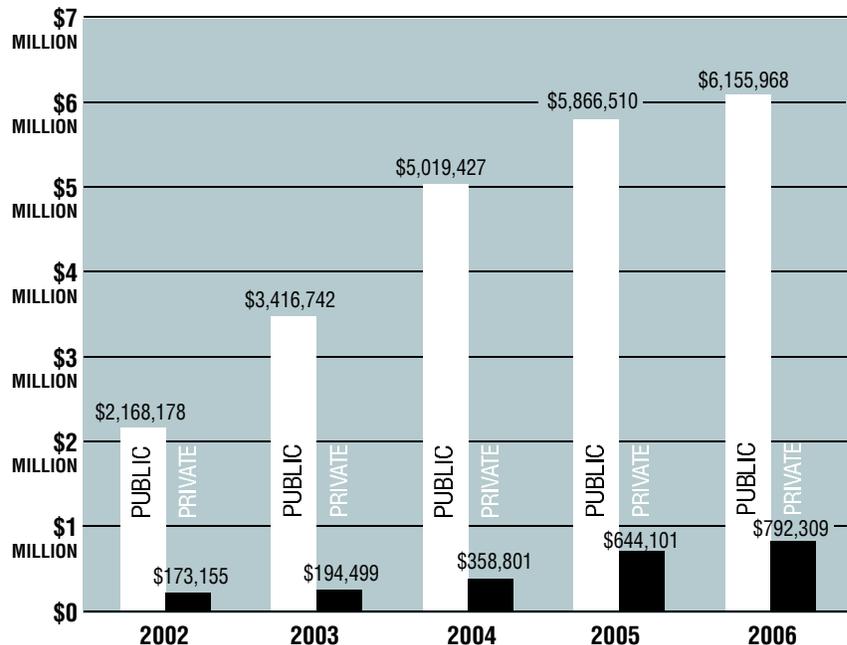
Figure 6 illustrates Manitoba where oral take-home drugs of the three aromatase inhibitors are provided mainly through the public, provincial Pharmacare plan. Xeloda, Temodal, Gleeevec and Tarceva are provided publicly for all age groups under the auspices of Cancer Care Manitoba. Here one can see that there is minimal private payer outlay for the studied cancer drugs.

In BC and Alberta the cancer agency budgets fully fund oral take-home drugs, and as a result these are not captured in the Brogan Inc. database. In those cases it is reasonable to assume the costs are at least comparable to those shown for Manitoba. Data for Saskatchewan are not available in the Brogan Inc. database.

**FIGURE 5 ATLANTIC CANADA**  
(NEW BRUNSWICK, NOVA SCOTIA AND NEWFOUNDLAND)  
**PUBLIC VERSUS PRIVATE PAY 2002–2006**



**FIGURE 6 MANITOBA**  
**PUBLIC VERSUS PRIVATE PAY 2002–2006**



## Private insurers and patients in different parts of the country bear very different burdens for the cost of cancer drugs.

### DISCUSSION

#### Cancer Drugs: Cost versus Access

Analysis of the data in Table 1 revealed that the cost of drugs to the private sectors of Ontario and Quebec is doubling every two years and in the provinces' public systems every two and a half to three years at least for oral take-home drugs. This trend, observed for only a small portion of the drugs studied (aromatase inhibitors, Xeloda, Temodol, Gleevec, Tarceva and to lesser extent Sutent), is disconcerting because the impact of many more new, high cost cancer drugs has yet to emerge. Aromatase inhibitors represent the most frequent claims but Gleevec represents the most costly drug for both the public and private payers (data not shown).

Gleevec is used for two relatively rare diseases, CML and GI stromal tumour, but many of the new generation of similar tyrosine kinase inhibitors have already shown activity across a number of different and more common cancers. Consequently the costs can be expected to escalate even more. Already trials are being reported or are in progress combining two or more new expensive cancer drugs or targeted therapies.

Large inter-provincial differences were detected, not only in the amount paid from the public versus the private purse as shown in Table 1 and Figure 2, but also in the total dollars spent on these drugs. The differences were not random but appeared to be restricted to provinces east of the Manitoba border, since the other western provinces are already providing them in their publicly-funded budgets. This variation in sources of payment for the drugs corroborates our impression stated in the 2006 Report Card that the eastern provinces rely more heavily on private pay for cancer drugs compared to the western provinces where access to and public coverage for cancer drugs is much more extensive. The numbers given do not include patient self-pay, which includes complete payment by the patient, co-payment with the insurance company or payment to a hospital for a drug not covered, nor the wide spread reliance on compassionate access to cancer drugs in the Atlantic provinces, previously documented, so the inter-provincial differences might be expected to be even larger.

### Conclusions

Data restrictions imposed by the nature of the database place some limits on generalizations which can be made. Also, the data did not allow us to compare the rate of increase for all cancer drugs versus all other drugs. However, as new life-saving cancer treatments rapidly enter the marketplace, the overall cost of cancer drugs will continue to increase at a rapid rate. Currently, however, while cancer drug costs are increasing, they generally comprise a small portion of the overall provincial drug budgets, usually less than 10 per cent. Further research is needed on this aspect but the early trends are unmistakable.

For the newer generation of oral, take-home cancer drugs already in the marketplace in Canada, the costs to both the public system and private insurers are increasing rapidly, despite multiple barriers to access and variable access within different parts of the country. Private insurers and patients in different parts of the country bear very different burdens for the cost of cancer drugs. Cancer patients themselves bear an inordinate financial burden vis-à-vis other patients with life-threatening disease, particularly east of the Manitoba border and even more so in the Atlantic provinces. Cancer patients, in large numbers, must rely on their private insurance plans, or in many cases on their own means to fund their life-saving treatment.

Notwithstanding the needed improvements for a more timely and efficient drug approval process, it is becoming abundantly clear that the public system cannot provide complete coverage for new cancer drugs entering the marketplace at the prices being charged for them.

Although we have shown that BC, in particular, and the western provinces in general, continue to have the best access to publicly funded cancer drugs, it is likely only a matter of time before private pay increases in the western provinces.

The corroboration of our impression last year that disproportionately large amounts were being spent in the private sector to pay for cancer drugs in provinces east of Manitoba encourages us to continue pursuing the relationship between drug access, cost, and cancer mortality. The cost differences documented herein may accurately reflect differences in the total cost of cancer

drugs and sources of payment in each province. If so, it would be a reasonable assumption that access to cancer drugs was and continues to be an important contributor to the inter-provincial differences in cancer mortality documented in our previous Report Cards. It is also likely that private cost sharing for drugs of the type studied here will soon increase in the western provinces. How the 3.5 million uninsured and underinsured Canadians will then continue to access expensive life-saving cancer drugs is unclear. More than likely most patients will not be able to afford them, with dire results.

The current data indicate that two-tier, or multi-tier medicine is becoming well established in the eastern half of Canada at least as far as provision of new oral take-home cancer drugs is concerned. And it is arriving in a completely unregulated and uncoordinated fashion.

### Recommendation

1. More data must be made available on cancer drug expenditures borne by public and private payers.

As shown in table 2, the dollar amount paid out by the public system for the drugs in question varies considerably among the provinces of Manitoba, Ontario, Quebec, and those in the Atlantic region. In particular, the greatest level of public support is seen in Manitoba, and is 60 per cent lower in provinces comprising the Atlantic region.

As shown in Table 3, the total dollar amount paid out (public plus private) for the drugs in question varies considerably from province to province. Since each province maintains its funding level relative to the others every year, (except for Manitoba in 2006), the inter-provincial differences become magnified with the passage of time, culminating in a difference of \$665 per case in 2006, comparing the Atlantic region with Quebec.

2. Data is needed on self-payment by patients for cancer drugs.
3. Only a multi-pronged, collaborative approach involving all the stakeholders will solve the complex issues around cancer drug access, cost and delivery.
4. The development of a nation-wide system providing equitable access to cancer drugs will require an independently-led process to determine how the various stakeholders can contribute to a seamless plan that protects vulnerable cancer patients.

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TABLE 2 PUBLIC PAY FOR CANCER DRUGS IN CANADIAN PROVINCES FOR 2002-2006, EXPRESSED PER ESTIMATED INCIDENT CANCER CASE IN EACH YEAR

	2002	2003	2004	2005	2006
Manitoba	409	621	880	1012	1043
Ontario	299	408	539	660	832
Quebec	340	537	664	775	942
Atlantic	159	200	238	336	368

TABLE 3 TOTAL PAY (PRIVATE PLUS PUBLIC) FOR CANCER DRUGS IN CANADIAN PROVINCES FOR 2002-2006, EXPRESSED PER ESTIMATED INCIDENT CANCER CASE IN EACH YEAR

	2002	2003	2004	2005	2006
Manitoba	442	657	944	1123	1178
Ontario	436	615	878	1086	1385
Quebec	471	779	1032	1235	1542
Atlantic	335	435	539	790	877