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The Misguided War against Medicines

Are Drug Expenditures Making Public Health Insurance Financially Unsustainable?

Brett J. Skinner and Mark Rovere

Executive summary

Research has shown that government expenditure on health in Canada is growing at an unsustainable pace [Skinner and Rovere, 2006]. At the same time, government spending on all types of prescription drugs (patented and non-patented) is increasing faster than any other component of health spending [CIHI, 2005]. And new or "patented" medicines tend to be more expensive compared to older drugs and other health treatments. These observations frequently lead to the claim that patented medicines in particular are the primary cause of unsustainable health-care costs in Canada [e.g. CUPE, 2006; CCPA, 2006]. In order to evaluate the validity of this claim, this study examines all of the ways in which patented drugs might contribute to health-care costs. The evidence suggests that neither patented drugs in particular nor pharmaceuticals in general can be blamed for the failure of government health insurance to remain financially sustainable.

Patented drugs are a small percentage of government spending on health

First, patented prescription drugs account for a small percentage of government spending on health care and therefore cannot be the primary cause of Medicare's financial unsustainability. While total spending on all types of drugs (patented and non-patented, prescription and non-prescription) accounted for 17.4% of total (government and private) health spending in Canada in 2005, prescription drugs accounted for only 9.6% of government spending on health care [CIHI, 2005]. Most importantly, patented prescription drugs in particular only accounted for an estimated 6.8% of annual government spending on health care in Canada in 2005 and much less in previous years [CIHI, 2005; PMPRB, 2006]. Therefore, even fast rates of growth in spending on patented drugs would not have had large statistical effects on the overall growth rate for government health expenditure over time.

Post-market prices for patented drugs stable

Price inflation for existing patented drugs is also not to blame for unsustainable growth rates in government spending on health. After-market prices for patented drugs have been stable for the last 18 years. In fact, the evidence shows that once patented medicines are introduced to the market, on average, prices for these drugs remain relatively flat and often decline. Canadian government data shows that average prices for existing patented prescription drugs in Canada have grown at a slower annual pace than the general rate of inflation for 16 of the last 18 years, and have declined in six of those years. By implication, this means that prices for existing patented drugs are increasing at an even slower rate than they are allowed to grow under

federal price controls that permit annual price increases matching the general rate of inflation [PMPRB, 2006]. It also means that after adjusting for inflation, prices for existing patented medicines have declined in real terms in 16 of the last 18 years.

Introductory prices for patented drugs are at or below international prices

Evidence also shows that introductory prices for patented medicines in Canada are lower than those in the majority of the countries that the federal government uses for international comparisons and far below American prices for identical drugs. This indicates that Canadian Medicare is not uniquely affected by high prices for new drugs and that this cannot be used as an excuse for unsustainable financing under our government health-insurance programs [PMPRB, 2006; Skinner 2005a].

New drugs, small markets, and high R&D costs means a high price per patient but a small impact on budgets

While it is true that on a global level the introductory prices of many new medicines are now much higher than the introductory prices of many drug products in the past, this is so because the cost of drug development remains high [Adams and Brantner, 2006; DiMasi et al., 2002] and many new drugs treat very small patient populations. The small market for these drugs requires that a higher price per unit be charged to recover the total risk-adjusted costs of research and development, which remain similar on average to the costs of developing drugs for much larger markets. However, while the price per patient is sometimes very high, the small patient populations being treated mean that the overall impact on government health budgets is not large.

Non-pharmaceutical spending on health growing at unsustainable pace

If it were true that drugs in general were the primary cause of unsustainable growth in government expenditure on health, then it stands to reason that, if we spent nothing at all on drugs, all other components of government health spending would be growing at sustainable rates. However, the evidence shows that when health spending is analyzed according to the use of funds spent, between 2001 and 2005 spending on non-pharmaceutical components of health care has consistently grown at unsustainable rates while accounting for between 91.8% and 90.4% of total government spending on health. On an average basis, spending on health professionals grew by 6.5% annually; spending on hospitals and institutions grew by 7% per year; and spending on government health, administration, research, and other areas together grew by 7.8% annually [CIHI, 2005]. These annual growth rates are between 1.3 and 1.6 times higher than the average annual growth in national gross domestic product (GDP) of 5% [Statistics Canada, 2006a]; 2.8 and 3.4 times higher than the average annual growth in general inflation (CPI) of

2.3% [Statistics Canada, 2006b]; and between 1.4 and 1.7 times higher than the average annual growth in consolidated provincial revenues from all sources of 4.5% over the same time period [Statistics Canada 2006c]. This means that, even if governments spent zero on drugs, government spending on all other medical goods and services would still be rising at an unsustainable rate. The fact that non-pharmaceutical medical goods and services make up over 90% of government expenditure on health strongly suggests that efforts to contain health care costs by targeting drugs are misguided.

Increasing use explains rising proportion spent on drugs

There are two well-documented, yet not widely understood, reasons that drugs are accounting for a rising share of health expenditures. One is the introduction of new drugs as treatments that did not previously exist. Second is the increasing use of drugs to replace or complement other forms of medical treatment [CIHI, 2006]. The available evidence suggests that the introduction of new drug treatments that did not previously exist, the substitution of drugs for other medical therapies, and the complementary use of drugs in conjunction with other treatments are positive developments that lead to improvements in human health and can produce net cost savings when all health spending is accounted for [Han and Wang, 2005; Cremieux et al., 2004; Lichtenberg and Virabhak, 2002; Kleinke, 2001; Lichtenberg, 2001; Frech and Miller, 1999].

To analyze the cost-efficiency of drugs as a medical treatment for this study, we compared changes in the rate of hospitalization against changes in the percentage of government spending on health on drugs between 1995 and 2003 (the only period for which there were available data). The data show that hospitalization rates have in fact declined at the same time that drugs have increased as a percentage of government spending on health in Canada [CIHI, 2005]. This correlation is broadly consistent with other research that shows that drugs are a cost-efficient substitute for other treatment alternatives requiring hospitalization.

Also, if spending on drugs is the primary cause of unsustainable growth rates in government expenditure on health, then as prescription drugs have increased as a percentage of government health budgets over time, we should observe increasing real (inflation-adjusted) rates of growth in per-capita (population-adjusted) government expenditure on health over time. But this is not observed. On a national basis, the annual growth rate in real per-capita health expenditures varies widely and is not in a linear relationship with the constantly increasing percentage of government expenditure on health going to drugs. In the context of the fact that drugs have increased consistently as a proportion of total government spending on health over the period studied, this result suggests that spending on drugs in general has substituted for spending on other non-pharmaceutical health care areas.

New drugs produce new health benefits

Of course it is also true that, because some medicines are new treatments that did not previously exist, they can represent net additional expenditures to existing health care budgets. Nevertheless, new treatments can also produce new medical benefits that did not previously exist, and thus represent a gain for patients in terms of health improvements and the reduction of pain and suffering. New health benefits can also be quantified in broader economic terms. For instance, a new medicine might lead to fewer in-patient admissions to hospitals or to faster overall recovery times for the treatment populations. Economic evidence shows that these kinds of health gains can result in reduced productivity losses associated with illness [Han and Wang, 2005; Lichtenberg, 2001].

The real problem—flawed design of government health and drug insurance

Acknowledging the cost effectiveness and cost efficiency of pharmaceuticals as a health care treatment does not in any way suggest that governments should spend more public money on drugs. In fact, government interference in health-care markets through public health and drug insurance programs actually distorts the efficient allocation of medical resources, including pharmaceuticals. Government health and drug insurance programs are not able to gain the efficiency benefits of new medical technologies like patented pharmaceuticals because such programs lack appropriate incentives for patients and providers to make optimal use of medical goods and services. Central planning is unable to compensate for this deficiency. The absence of consumer price signals to influence the demand for, and determine the allocation of, resources; the politicization of centrally planned allocation; and the impossibly large information requirements needed to plan for patients' individual health-care needs and preferences are insurmountable structural obstacles faced by government health insurance and drug programs. Economic evidence suggests that properly designed, private-payment, health systems (insurance and out-of-pocket spending) are better structured to encourage the rational allocation of health technology and optimize overall efficiency gains [Danzon, 1993; Newhouse et al., 1993].

Government drug-insurance programs are also notorious for restricting access to new medicines in a misguided attempt to control costs. When government health insurance attempts to provide equal access and 100% insurance coverage for any medical need on a universal basis, then the system becomes financially unsustainable. Therefore, when governments are committed to enforcing egalitarian access, they inevitably deny everyone access to the more expensive medical goods and services, which are usually the latest and most advanced technologies—including patented medicines. This means that, under a government health-insurance monopoly like that which exists in Canada, patients go without the most advanced treatments if they do not have the

option to buy private insurance or pay directly for the latest developments in health technology. Relying instead on compulsory, universal, private insurance coverage, including a larger set of health-care products and services than Canada's provincial health programs do, in a properly regulated competitive market would be more efficient than Canada's government health-insurance monopoly and various government drug programs.

Conclusion

At various times throughout the history of Canadian Medicare, the unsustainable growth in government health-care spending has been blamed on the cost of paying for physicians, hospitals, and medicines. This misguided focus on the components of health spending has led governments to rely on central planning to cap the supply of physicians [Esmail, 2005] and hold their wages below market rates [Skinner, 2002; Mullins, 2004]; to constrain hospital operating and capital resources [OHA, 2003]; and to restrict access to new technologies and treatments, leaving Canadian patients to go without the most advanced medical care available [Esmail and Walker, 2005; Skinner, 2005b].

It is a mistake for policy makers to engage in top-down cost-containment strategies targeting the individual components of health-care spending. Unsustainable growth in government spending on health is a function of the flawed design of government health and drug insurance programs, not of the price of medical treatment or the introduction of new medical technologies like patented pharmaceuticals.

Introduction

Research has shown that government expenditure on health in Canada is growing at an unsustainable pace. Since the year 2000, at least five studies by provincial governments, in addition to a federal Senate report, have concluded that government spending on health is unsustainable at current growth rates [Clair, 2000; Fyke, 2001; Mazankowski, 2001; Kirby, 2002; Menard, 2005; Taylor, 2006]. The most recent and urgent warning has come from Carole Taylor, British Columbia's Finance Minister, whose departmental analysts estimated that government spending on health would consume 71% of the provincial budget by 2017. Even Janice MacKinnon, the former finance minister in Roy Romanow's NDP government in Saskatchewan, warned in a privately published study in 2004 that health spending was growing faster than the ability of governments to pay for it [MacKinnon, 2004].

An annual Fraser Institute study using Statistics Canada data on the most recent five-year trends shows that government spending on health in every province continues to grow faster, on average, than total revenues from all sources—including federal transfers [Skinner 2004, 2005c; Skinner and Rovere, 2006]. Health care is taking up an increasing share of provincial revenue over time, leaving proportionally less money for everything else. The most recent analysis shows that government spending on health in six of the ten provinces is on pace to consume more than half of total revenue by the year 2020, two thirds by the year 2035, and all of provincial revenue by 2050 [Skinner and Rovere, 2006].

At the same time, government spending on all types of prescription drugs (both patented and non-patented together) is increasing faster than any other component of health spending, growing by 12.4% over the previous year in 2005 [CIHI, 2005]. And new or "patented" medicines can be very expensive compared to older drugs and other health treatments. These observations lead some to conclude that patented medicines must be the primary cause of unsustainable health care costs in Canada [e.g. CUPE, 2006; CCPA, 2006].

But such a conclusion is incorrect because it is either based on false assumptions about the prices of patented drugs in Canada; a failure to distinguish between total drug spending and government spending on patented prescription medicines in particular; a failure to understand the cost efficiency of medicines as a health technology; or a failure to count the health and economic benefits from new drugs. This analytical error results from a misguided focus on the cost of the goods and services that make up modern medical care instead of on the fundamental flaws in Canada's government health and drug insurance programs.

The particular impact of new or "patented" drugs on government health-care costs

Patented drugs are a small percentage of government spending on health

Patented prescription drugs do not account for a large enough percentage of health-care costs to be having a major impact on overall growth rates in government spending on health. It is important to analyze government spending on health care separately from private health-care expenditures. Spending on all types of drugs (patented and non-patented, prescription and non-prescription) together accounted for 17.4% of total (government and private) health spending in Canada in 2005 [figure 1a]. [1]

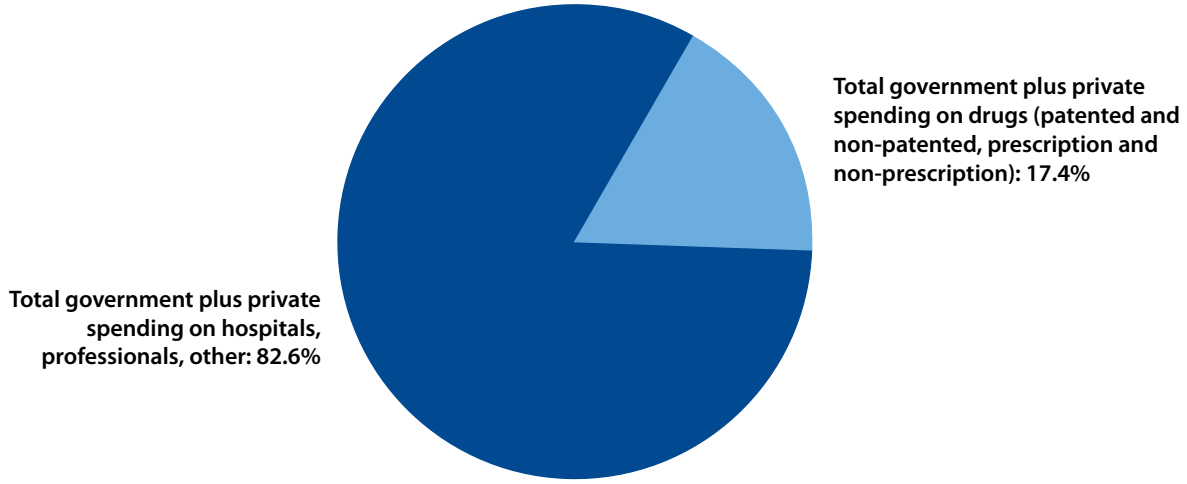
But, while all types of drugs (patented and non-patented, prescription and non-prescription) accounted for a significant percentage of total government and private health expenditure, prescription drugs (patented and non-patented) accounted for only 9.6% of government spending on health care [figure 1b]. And, this share has been much smaller in the past [figure 1c].

Further, patented prescription drugs in particular account for an even smaller share of government expenditure on health. The Canadian Institute for Health Information (CIHI) publishes data separating total private from total government spending on prescription drug products but does not publish data that would allow a precise calculation of the percentage of government expenditures on drugs that are accounted for by patented prescription medicines separately from non-patented drugs. However, the Patented Medicine Prices Review Board (PMPRB), Canada's federal drug-price regulator, publishes data [table 1] showing that patented drugs accounted for 71% of total national drug sales in Canada in 2005, up from 43% in 1990 [PMPRB, 2006].

Assuming that patented drugs account for the same percentage of government drug spending as for total drug spending means that patented prescription drugs accounted for only 6.8% [calculation 1 (p. 10)] of total annual government spending on health care in Canada in 2005 [figure 1b] and still smaller percentages in past years [table 1]. Therefore, even high rates of growth in spending on patented drugs could not have large statistical effects on the overall growth rate for total government expenditure on health in any given year relative to the impact of the other components of health spending.

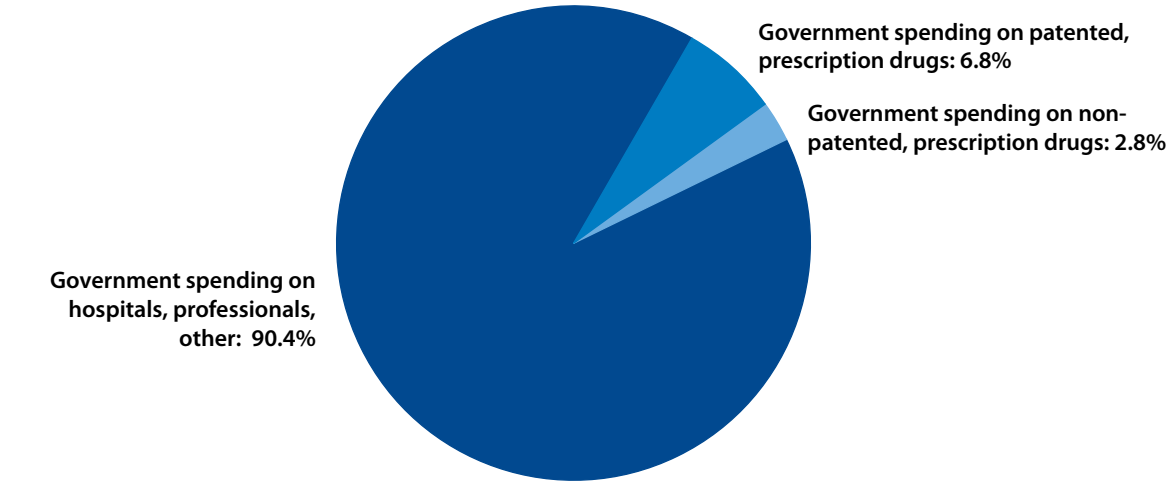
[1] CIHI data for drug expenditures accounts only for outpatient drugs. Drugs administered in hospital are counted under hospital expenditures and are not shown separately. However, most drugs administered in hospital are likely to be for anesthesia or to control pain and infection, which are almost always generic drugs.

Figure 1a: Percentage of total government plus private health spending in Canada, 2005, by use of funds



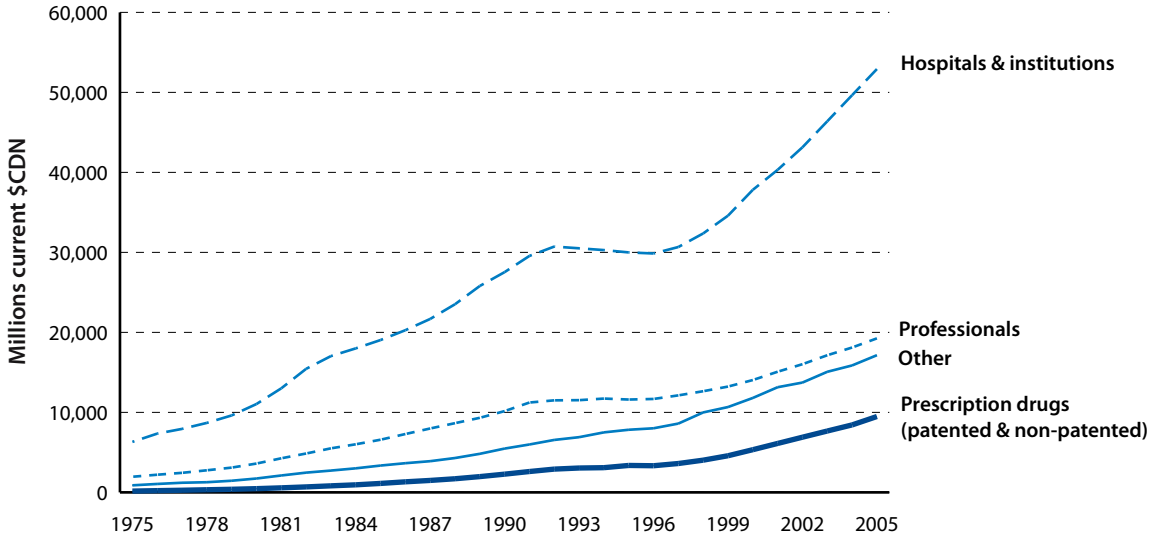
Source: Canadian Institute for Health Information [CIHI], 2005.

Figure 1b: Percentage of government health expenditure (GHEX) in Canada, 2005, by use of funds



Sources: Canadian Institute for Health Information [CIHI], 2005; Patented Medicine Prices Review Board [PMPRB], 2006; calculations by authors.

Figure 1c: Government health expenditure (GHEX) in Canada, 1975 to 2005, by use of funds



Source: Canadian Institute for Health Information [CIHI], 2005.

Table 1: Patented drugs' share of total drug sales in Canada, 1990 to 2005

	Total drug sales ($ billions)	Patented drug sales ($ billions)	Patented drug sales, percentage of total
1990	$3.7	$1.7	43%
1991	$4.4	$2.0	43%
1992	$4.8	$2.2	44%
1993	$5.4	$2.4	44%
1994	$5.9	$2.4	41%
1995	$6.0	$2.6	44%
1996	$6.6	$3.0	45%
1997	$7.0	$3.7	52%
1998	$7.8	$4.3	55%
1999	$8.9	$5.4	61%
2000	$10.0	$6.3	63%
2001	$11.5	$7.5	65%
2002	$13.1	$8.8	67%
2003	$15.1	$10.1	67%
2004	$15.9	$10.9	69%
2005	$16.1	$11.5	71%

Source: Patented Medicine Prices Review Board, 2006.

Calculation 1: Patented (IP) prescription (R_x) drugs as a percentage of government (G) health expenditures (HEX) in 2005

2005 GHEX = 98795.4 ($millions)	[Source: CIHI, 2005]
2005 GR_x = 9481.4 ($millions)	[Source: CIHI, 2005]
2005 IP drugs % of total drug sales = 71%	[Source: PMPRB, 2006]
2005 IPR_x % of GHEX = 9481.4 × 71% = 6731.8 / 98795.4 = 6.8%	[Source: Author]

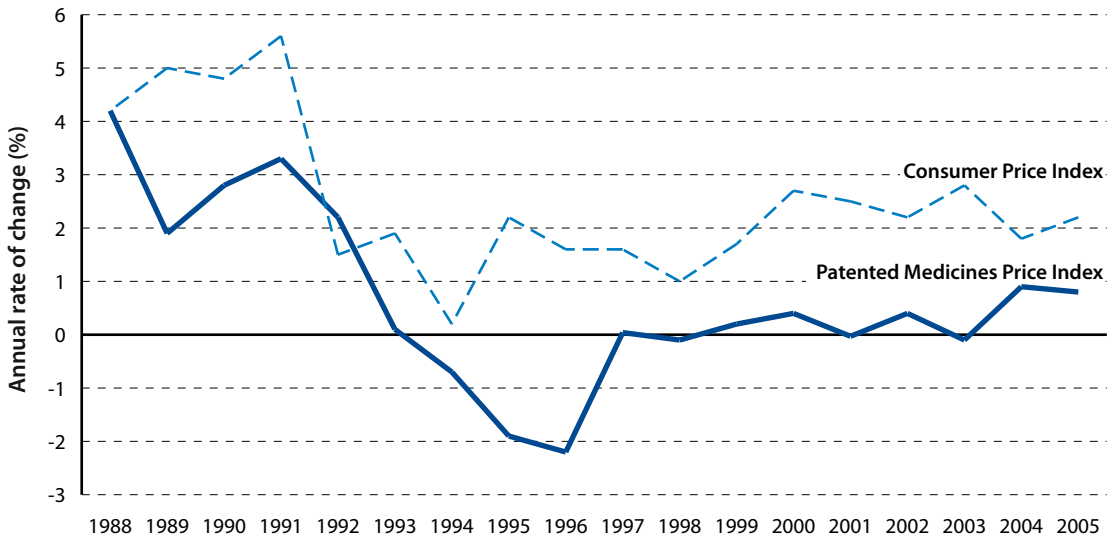
Post-market prices for patented drugs stable

Evidence collected by Canada's federal drug-price regulator, the Patented Medicine Prices Review Board (PMPRB), confirms that, on average, post-market prices for patented drugs are not growing rapidly or persistently over time. In order to monitor the price trends of patented drugs in Canada, the PMPRB maintains the Patented Medicine Price Index (PMPI). Since 1988, the PMPI has been used to measure the average annual change in prices of patented drugs using a basket of products already on the market [PMPRB, 2006]. The most recent data available from the PMPI is current to the year 2005.

PMPRB data show that post-market prices for patented pharmaceuticals in Canada have been stable or declining over the last 18 years [figure 2]. The largest annual increase in average prices between 1988 and 2005 occurred in the first five years (1988–1992) after the PMPRB began measuring patented drug prices in Canada. However, even during this five-year period, patented drug prices increased only 2.9% annually, on average. After the first five years, prices grew at a much slower rate and even declined in some years. Notably, the data show that prices on patented drugs in Canada have actually decreased in six of the last 18 years. Overall, the average annual growth in prices for the entire 18-year period was a mere 0.7%. The evidence on changes in patented drug prices over time refutes the notion that the average post-market price of Canadian patented drugs has been persistently or rapidly increasing.

The PMPRB also compares the PMPI to the Consumer Price Index (CPI) [PMPRB, 2006]. By doing so, the PMPRB can determine the year-to-year changes in existing patented drug prices in comparison to changes in general inflation for other goods and services. Figure 2 shows the year-to-year changes in the PMPI compared to the CPI from 1988 to 2005. Throughout the 18-year period, 1992 is the only year where the average annual price growth of patented pharmaceuticals exceeded general price inflation; in other words, the general inflation rate exceeded the average growth in the price of patented drugs that were already on the market 94% of the time. Over the entire period, the annual percentage growth in the CPI (2.5%) exceeded the annual percentage growth in the PMPI (0.7%) by 1.8 percentage points.

Figure 2: Annual rates of change in the Patented Medicines Price Index (PMPI) and the Consumer Price Index (CPI), Canada (1988–2005)



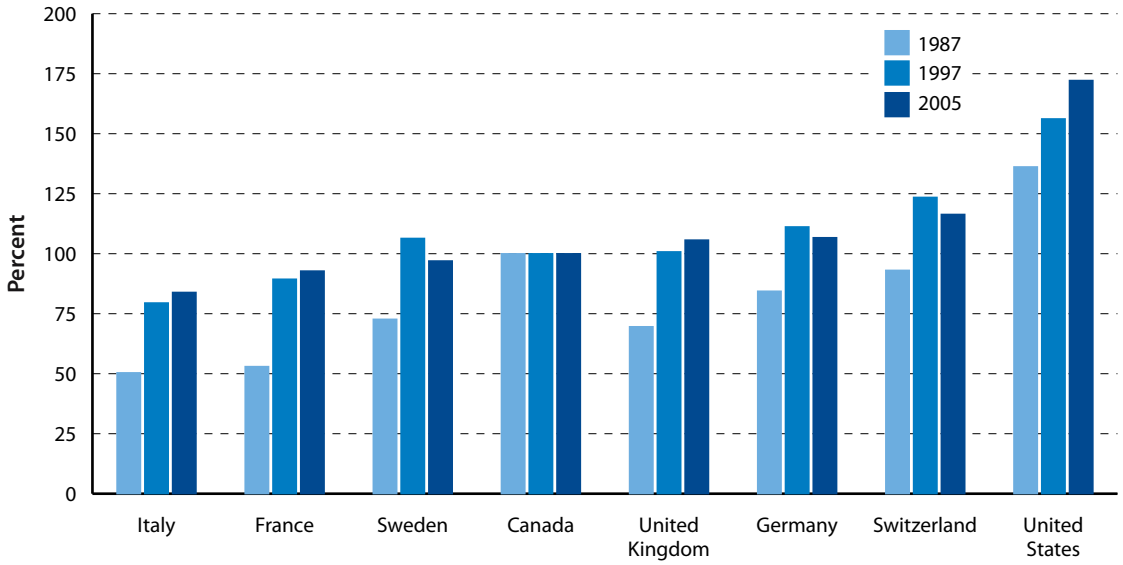
Source: Patented Medicine Prices Review Board [PMPRB], 2006.

Introductory prices for patented drugs are at or below international prices

The PMPI only measures average annual price changes for a basket of patented drugs already on the market and, therefore, does not capture the impact on health budgets from introductory prices for new drugs [PMPRB, 2006]. However, in order to measure whether introductory prices for new drugs are excessive, the PMPRB compares the average price of patented drugs in Canada to prices for the same drugs in a select group of other countries. Figure 3 shows the difference between average prices for patented drugs in Canada (shown as a constant) and the average prices for the same patented drugs for the years 1987, 1997, and 2005 in France, Germany, Italy, Sweden, Switzerland, the United Kingdom, and the United States [PMPRB, 2006]. As figure 3 shows, the average price of Canadian patented pharmaceuticals in 1987 was higher than that in every other country of the select group except for the United States. By 1997, the average Canadian price for patented drugs was lower than that in all of the comparison countries except Italy and France. This trend continued through 2005. Prices for patented medicines in Canada are therefore consistently lower than those in the majority of the countries used for international comparisons by the federal government.

The Fraser Institute's research comparing Canadian and American drug prices has also confirmed that the prices of patented drugs are much lower in Canada. Skinner [2005] looked at a sample of the 100 top-selling, brand-name (mostly patented)

Figure 3: Average ratios between international and Canadian prices for patented drugs (1987, 1997, 2005)



Source: Reproduced from Patented Medicine Prices Review Board [PMPRB], 2006.

drugs in Canada in 2003 and compared their prices to those of the same drugs sold in the United States. The analysis showed that Canadian prices for patented, brand-name drugs were 43% lower on average than American prices for the same drugs, measured in US dollars at purchasing power parity.

New drugs, small markets, and high R&D costs means a high price per patient but a small impact on budgets

While it is true that, worldwide, the introductory prices of many new medicines are now much higher than the introductory prices of many drug products in the past, this is so because the cost of drug development remains high but the market for many new drugs is very small. Research indicates that on a risk-adjusted basis it costs over $800 million (2002 US$) on average to develop a new drug [Adams and Brantner, 2006; DiMasi et al., 2002; DiMasi, 2001]. And many new drugs are now treating very small patient populations. The small market for these drugs requires that a higher price per unit be charged to recover the total costs of research and development, which are similar on average to the costs of developing drugs with much larger markets.

However, because many new drugs treat small patient populations, the overall impact of new drugs on budgets is often smaller than what might be expected. For instance, *Herceptin* is a drug that is widely believed to be effective in reducing the

recurrence of breast cancer in women. *Herceptin*'s price is reported to be over $35,000 (2006 CDN$) per patient for a full course of treatment but, because the number of patients the drug is meant to treat is so small (about 5000 Canadian women [CBC, 2006]), the annual total costs represent an estimated $175 million (2006$) annually. The total costs of this drug are therefore only about 1.8% of the $9.5 billion spent by governments on prescription drugs in Canada in 2005 [CIHI, 2005]. Similarly, *Velcade*, a new drug that treats a cancer of the blood that affects 1,500 Canadians per year costs $50,000 per patient [Abraham, 2005], representing a total estimated cost of $75 million annually, or less than 1% of annual government spending on prescription drugs across Canada in 2005. The story is the same for patients suffering from Fabry's Disease, which affects only 1 in 100,000 Canadians, or 320 patients in all. The disease causes the lack of a vital enzyme in the body thus leading to kidney failure, heart disease, strokes, and premature death. New enzyme-replacement therapies approved by Health Canada in early 2004 cost an average of $250,000 per patient [Fabry Society, 2005]. The total estimated, potential, annual impact on government drug budgets from the enzyme replacement therapies is $80 million or less than 1% of the amount spent annually by governments in Canada for drugs in 2005 [CIHI, 2005]. Taken together, the $330 million cost of funding these three drugs would add only 0.3% [calculation 2] to total government healthcare expenditures in Canada in 2005.

Calculation 2: Cost of three expensive new drugs with small patient populations relative to overall total government (G) health expenditures (HEX), and government spending on prescription (R_x) drugs.

2005 GHEX = 98795.4 ($millions)	[Source: CIHI 2005]
2005 GR_x = 9481.4 ($millions)	[Source: CIHI 2005]
2005: 3 new drugs cost = 330 ($millions)	[Sources: various above]
2005: 3 new drugs cost % of GR_x = 330 / 9481.4 = 3.5%	[Source: Author]
2005: 3 new drugs cost % of GHEX = 330 / 98795.4 = 0.3%	[Source: Author]

The impact of all types of drugs on government health-care costs

Non-pharmaceutical spending on health growing at unsustainable pace

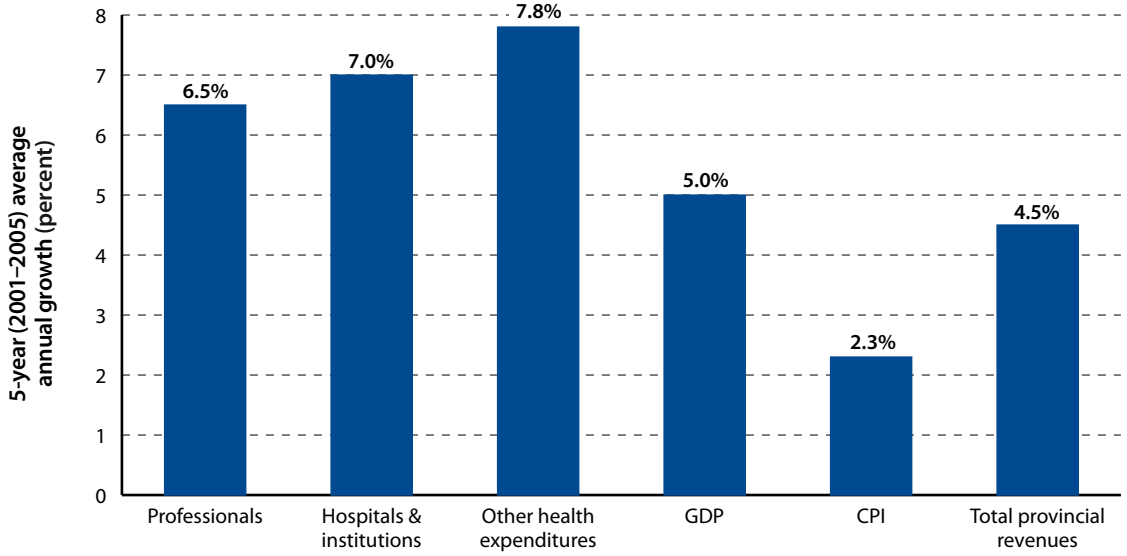
Even if we were hypothetically able to subtract the small statistical impact that the general use of drugs has on the overall growth rate in health care by reducing government spending on all drugs to zero, government expenditures on the remaining goods and services that make up modern health care are still growing at an unsustainable pace.

When health spending is analyzed according to the use of funds spent, spending between 2001 and 2005 on non-pharmaceutical components of health care has consistently grown at an unsustainable rate while accounting for between 91.8% and 90.4% of total government spending on health [figure 4]. On an average basis, spending on health professionals grew by 6.5% annually; spending on hospitals and institutions grew by 7% per year; and spending on government health, administration, research, and other areas together grew by 7.8% annually [CIHI, 2005]. These annual growth rates are between 1.3 and 1.6 times higher than the average annual growth in national gross domestic product (GDP) of 5% [Statistics Canada, 2006a]; between 2.8 and 3.4 times higher than the average annual growth in general inflation (CPI) of 2.3% [Statistics Canada, 2006b]; and between 1.4 and 1.7 times higher than the average annual growth in consolidated provincial revenues from all sources of 4.5% [Statistics Canada, 2006c]. This means that, even if governments spent zero on drugs, government spending on all other medical goods and services would still be rising at an unsustainable rate. The fact that non-pharmaceutical medical goods and services make up over 90% of government expenditure on health strongly suggests that efforts to contain health-care costs by targeting drugs are misguided.

Variation in growth of government health expenditure unrelated to the variation in the proportion spent on drugs

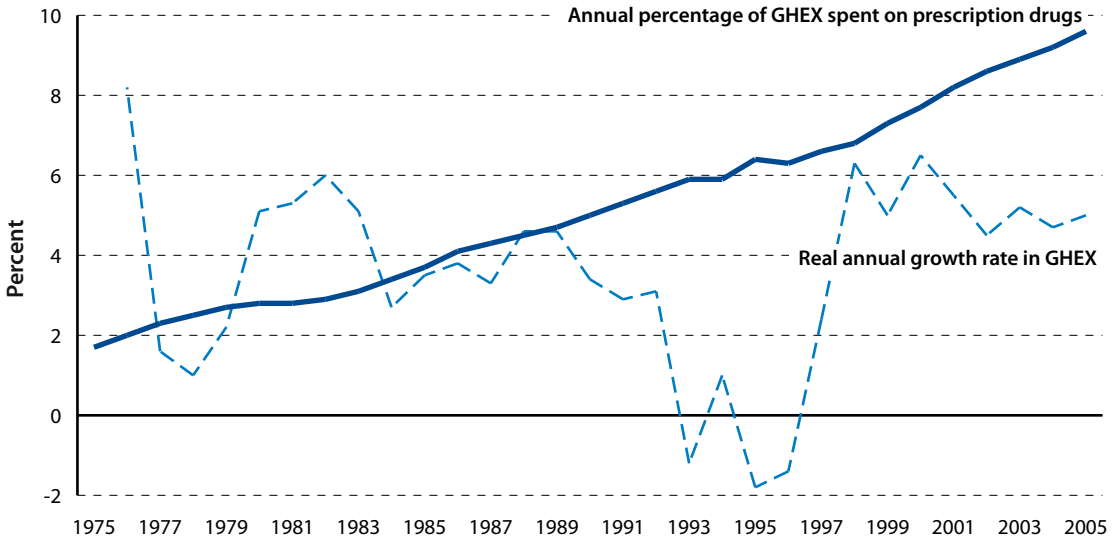
If spending on drugs is disproportionately linked to unsustainable growth rates in government expenditure on health, then, as prescription drugs increase as a percentage of health spending over time, we should observe increasing rates of growth in government spending over the same period. But this is not observed: for over 30 years prescription drugs have increased annually as a percentage of government spending on health but variation in the pace of the annual growth rate for government spending on health overall has remained unrelated to the variation in the portion of the health budget spent on drugs [figure 5].

Figure 4: Growth rates of non-pharmaceutical government health expenditure (GHEX), GDP, CPI, and total provincial revenues from all sources



Source: Canadian Institute for Health Information [CIHI], 2005; Statistics Canada, 2006a, 2006b, 2006c.

Figure 5: Annual percentage growth rate in government health expenditure(GHEX) compared to annual percentage of GHEX spent on prescription drugs in Canada, 1975 to 2005



Source: Canadian Institute for Health Information [CIHI], 2005.

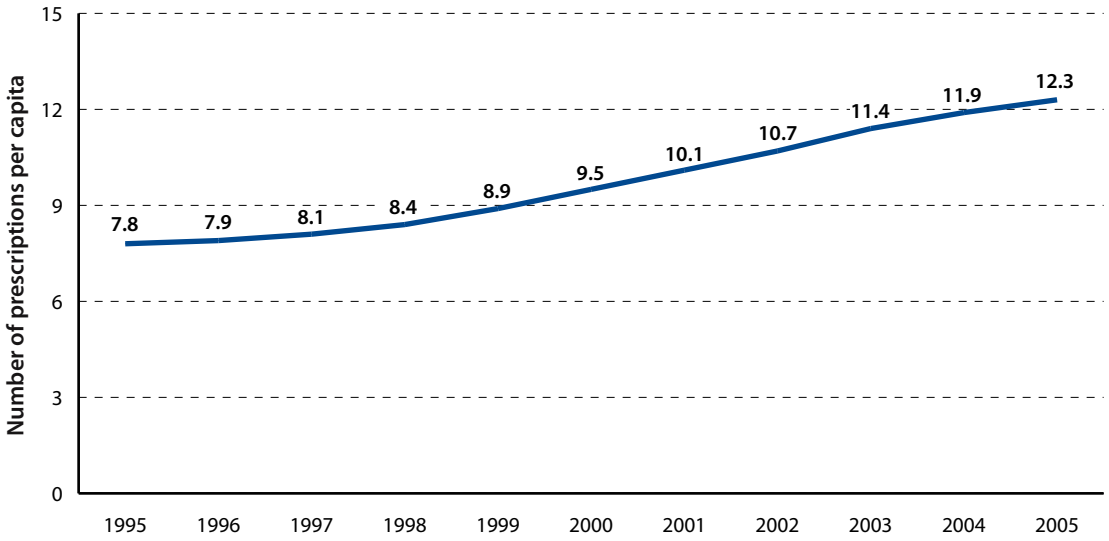
Increasing use explains rising proportion spent on drugs

Why are drugs increasing as a percentage of total government spending on health over time? The rising percentage of the health budget spent on drugs is a direct result of the development of new drug therapies and the increasing use of drugs to replace other medical treatments [CIHI, 2005]. Figure 6 shows the rising per-capita use of drugs over the ten years between 1995 and 2005 (the only period for which data were available). "Use" is defined here as the number of retail prescriptions dispensed per person annually; it has risen, even when adjusted for growth in the population. It is this that largely explains why drugs have risen as a percentage of total and government spending on health.

Drugs are a cost-efficient and often cost-saving medical technology

How can drugs be increasing as a percentage of government spending on health and not be the primary cause of unsustainable growth rates in government expenditure on health? Research shows that drugs can be a cost-effective, cost-efficient, and cost-saving medical technology. A *cost-effective* drug produces a marginal benefit that is equal to, or better than, any alternative treatment at a fixed cost [Weimer and Vining, 1999: 274]. A *cost-efficient* drug produces a marginal benefit that is equal to, or greater than, its own marginal cost [Danzon, 1993]. A *cost-saving* drug is one that, when used, substitutes for alternative medical treatments, leading to lower overall spending than would have occurred if it had not been used [Han and Wang, 2005].

Figure 6: Number of retail prescriptions dispensed per capita in Canada, 1995 to 2005



Source: IMS Health Incorporated Canada, 2006.

Pharmaceuticals are being used more because they are a good substitute for older, less effective or less efficient, ways of treating illness. Research has established that there is a strong statistical relationship between drug spending and health outcomes. An analysis of health outcomes among Canadian provinces found that the two provinces with the highest levels of expenditure on drugs averaged 584 fewer infant mortalities annually, and showed a six-month increase in life expectancy at birth, compared to other provinces [Cremieux et al., 2005]. In addition, the study's results indicate that there was a significant increase in health benefits in Canada corresponding to an increase in pharmaceutical spending during the period 1981 to 1998. The study concluded that there is a quantifiable positive relationship between drug spending and health outcomes. [2]

Another study found similar results when comparing the use of pharmaceuticals at the international level. The research discovered that pharmaceutical spending has a positive and significant effect (both statistically and economically) on remaining life expectancy at age 40 and at age 60, whereas non-pharmaceutical health-care spending appears to have no measurable effect on life expectancy, either at birth, at age 40, or at age 60 [Frech and Miller, 1999].

Drugs can also have a cost-savings effect on overall health expenditures because they are a substitute for invasive surgery or lengthy courses of treatment in hospital, and thereby reduce risks, pain, and discomfort to patients, improve recovery times, and reduce more costly expenditures on other forms of medical treatment. Research has estimated that, for every dollar spent on new pharmaceuticals, between $3.95 and $7.00 is saved on non-drug spending elsewhere [Lichtenberg and Virabhak, 2002]. Research suggests that if we spent less on new drug technologies and relied, instead, on older, less efficient, types of medical treatment, we could end up with even higher overall health-care costs than we have right now. [3]

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[2] The results of Cremieux and Ouellette indicate that "the observed increase from 1981 spending levels has already saved over 15,000 lives" (2002: 115).

[3] In contrast to Lichtenberg's findings on the cost-saving benefits of newer drugs, there is opposing research that suggests that drugs, and specifically new drugs, do not present a reduction in costs for non-drug expenditures. Miller et al. argue that the number or mix of drugs used is an important indicator in determining the association between drug age and non-drug expenditure [Miller et al., 2005]. Miller et al. first replicated Lichtenberg's work and confirmed the validity of Lichtenberg's findings. Afterward, using a different method, they analyzed only patterns of use for new cardiovascular drugs and the association of this with non-drug health expenditures. They controlled for the drug quantity and the mix of newer and older drugs as a proxy for controlling severity of illness. They found, unsurprisingly, that the net cost-savings effect of cardiovascular drugs did not apply to the sickest patients.

In a study similar to that of Miller et al., Duggan investigated the effects of new drugs focusing solely on one therapeutic class. The objective was to determine if new antipsychotics reduce spending on other types of medical care such as the demand for hospitalization and other health-care services [Duggan, 2005]. Duggan's study suggested that new antipsychotic drugs

In this study, in order to test the substitution effect of drugs for other types of health care at the macro-level, we compared changes in the rate of hospitalization against changes in the percentage of government spending on health on drugs between 1995 and 2003 (the only period for which there were available data). The data show [figure 7] that hospitalization rates have in fact declined at the same time that drugs have increased as a percentage of government spending on health in Canada. While this finding does not indicate a causal relationship, the results are broadly consistent with other research that shows that drugs are a cost-efficient and often a cost-saving substitute for non-drug treatment alternatives. [4]

New drugs produce new health benefits

Those who claim that drugs are a major contributor to unsustainable health costs also tend to ignore the value of the health improvements that new drugs can bring. Of course, it is true that, because some medicines are new treatments that did not previously exist, they can represent net additional expenditures to existing health-care budgets. Nevertheless, new treatments can also produce health benefits that did not previously exist and thus represent a gain for patients in terms of health improvements and the reduction of pain and suffering. For instance, the increase in life expectancy and health status of patients with heart disease, cancer, preterm birth, and acquired immunodeficiency syndrome (AIDS) is a direct result of major pharmaceutical breakthroughs in the 1990s [Kleinke, 2001; Lichtenberg, 2003].

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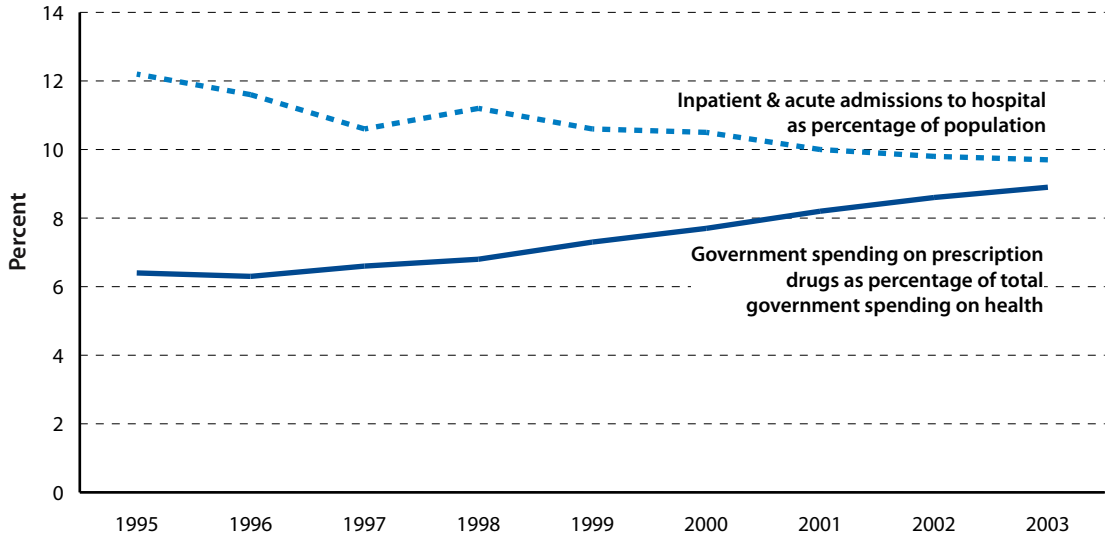
increase the prevalence of diabetes and related illnesses among schizophrenia patients, thus having a negative effect on health outcomes. However, he also found that while antipsychotics increased the prevalence of diabetes among schizophrenia patients, the drugs reduced the occurrence of extra-pyramidal symptoms although he failed to estimate the savings from this.

The studies by Miller et al. and Duggan are interesting but not useful for analyzing the overall impact of drugs on health budgets. Despite claims to the contrary, these studies do not contradict Lichtenberg, who analyzed the effects of new drugs averaged across all patients and all illness conditions. The conclusions of the study by Miller et al., in particular, were skewed because it focused upon the sickest group of patients only, instead of on all patients. Also, while specific illnesses such as cardiovascular-related diseases and antipsychotic ailments may cover a large portion of pharmaceutical spending, drug expenditures are fairly divided among other therapeutic classes. The Patented Medicine Price Review Board's annual report for 2005 indicates that in Canada there is not one therapeutic class that represents more than 25% of the share of sales for patented drugs [PMPRB, 2006]. Therefore, a general analysis of all medical conditions and all drugs related to those conditions should be included in order to analyze the bona-fide effects of overall pharmaceutical spending effectively.

[4] Other changes that will affect hospitalization include advances in outpatient treatment and day surgery.

Figure 7: Proportional government spending on prescription drugs compared to hospitalization rates in Canada, 1995 to 2003)



Source: Canadian Institute for Health Information [CIHI], 2006a, 2006b.

The value of new health benefits can also be quantified in broader economic terms. For instance, a new medicine might lead to fewer in-patient admissions to hospitals or to faster overall recovery times for treatment populations. Economic evidence shows that these kinds of health gains result in reduced productivity losses associated with illness. If the reduction in productivity losses is taken into account, there could be net socioeconomic benefits from drugs.

Research indicates that newer drugs decrease morbidity, thus reducing its negative effects on productivity. One study suggests that there is a direct correlation between absenteeism and harmful effects on the economy. The authors estimated that absenteeism in Canada costs approximately $2,012 per worker annually [Han and Wang, 2005]. Their findings suggest that depression, which is the second most common condition next to hypertension, is one of the most prevalent reasons for absenteeism. They assert that pharmacotherapy is key to reducing the societal and economic burden of depression. In addition, the research suggested that newer drugs are more effective at reducing absenteeism than older ones. Similarly, other research has found that people consuming new drugs were significantly less likely to experience absenteeism than people taking older drugs [Lichtenberg, 2001]. Thus, not only do pharmaceuticals in general reduce the rate of morbidity but also research indicates that newer drugs significantly reduce absenteeism in the workplace. Therefore, even if some expensive new drugs do not offer direct cost savings associated with their use, the effects on the economy as a result of the efficacy of newer drugs could indirectly save money.

The real problem—the flawed design of government health and drug insurance

Acknowledging the cost effectiveness and cost efficiency of pharmaceuticals as a health care treatment does not in any way suggest that governments should spend more public money on drugs. [5] In fact, government interference in health-care markets through public health and drug insurance programs actually impedes the efficient allocation of medical resources. Government health and drug insurance programs are not able to gain the efficiency benefits of new medical technologies like pharmaceuticals because such programs lack appropriate incentives for patients and providers to make optimal use of medical goods and services. Central planning is unable to compensate for this deficiency. Economic evidence suggests that private-payment health systems (a combination of private insurance and out-of-pocket spending) are better structured to encourage the rational allocation of health technology and capture overall efficiency gains [Danzon, 1993; Newhouse et al., 1993].

[5] At the same time, the cost-effectiveness, cost-efficiency, and cost-saving effects generally associated with new drugs demonstrate the significant advantage of new pharmaceuticals as they present value for money while increasing quality of life. When drug insurers determine which pharmaceuticals should be added to drug formularies, these effects are sometimes overlooked. In order to cut costs, many government insurers, such as provincial governments in Canada and Medicaid in the United States, do not add new drugs to their formularies because the prices of newer drugs are higher than older drugs already in use. However, instead of reducing costs, in the long run these rationing techniques may end up costing the government health systems more than if the newer, more expensive, drugs were added to their formularies. As stated by J.D. Kleinke, "the more a third-party payer limits patients access to drugs, the higher its total health care costs are in excess of drug-costs savings" [2001: 48]. Likewise, Stephen B. Soumerai argues that, when cost-control policies are used by government insurers to forgo the addition of new expensive drugs, patients will likely suffer, and side effects could reduce appropriate care, thus harmfully affecting health status, which can lead to more costly types of care [2004]. Hence, not adding newer more expensive drugs to formularies can lead to increases in non-drug-related health services. Third party payers must realize that the cheapest drug budget is not necessarily the best and will likely result in greater expenses for "other," non-drug health-care costs.

This is a general problem of the structure of health insurance today. Most health insurance today is single-period pooling (money in today is money out today with the hopes that some is left at the end of the year for extra profit or surplus). There is little insurance being done over the lifetime of the individual, building reserves in good years to pay out in worse years. Capitalization of insurance would go a long way towards creating incentives to invest in access to new technologies with cost-effectiveness, cost-efficiency, and cost-saving effects [Ferguson, 2006].

Any kind of insurance (private or government) insulates the consumer from price to some degree and this can distort supply-and-demand decisions. But unlike private-sector insurance, elected officials who are highly sensitive to egalitarian political pressures run government programs. Political pressures create powerful incentives for politicians to reduce any out-of-pocket expense toward zero and to base premiums on heavy cross-subsidization according to income, instead of on expected use or even equal risk-pooling (i.e. community rating). The resulting absence of consumer price signals removes the necessary economic incentives to influence the demand for goods and services. Exposure to price helps to control price inflation and creates incentives for the efficient allocation of resources matching the individual needs and preferences of patients [Herrick, 2006]. The politicization of centrally planned allocation distorts decisions about investment and spending. Political pressures and the impossibly large information requirements needed to plan for patients' individual health-care needs and preferences are insurmountable structural obstacles faced by government health insurance and drug programs that are not faced by private-sector insurers who are better able to react to price signals and changes in supply and demand.

Government drug-insurance programs are notorious for restricting access to new medicines in a misguided attempt to control costs. When government health insurance attempts to provide equal access and 100% insurance coverage for any medical need on a universal basis, then the system becomes financially unsustainable. Therefore, when governments are committed to enforcing egalitarian access, they inevitably deny everyone access to the more expensive medical goods and services, which are usually the latest and most advanced technologies—including patented medicines. This means that under a government health-insurance monopoly like that existing in Canada, patients go without if they do not have the option to buy private insurance or pay directly for the latest developments in health technology.

Canadian government health insurance is also divided into silos. Government insurance covers 100% of the cost of medical services delivered by hospitals and physicians but does not generally cover the cost of out-patient goods and services except for certain sub-populations like seniors, the disabled, and social-welfare recipients. And when government insurance does cover outpatient health care, it does not pay for 100% of the costs. [6] This lack of comprehensive coverage makes the out-of-pocket cost of

[6] Those who argue that restricting access to new medicines under government drug programs is legitimate because dissatisfied beneficiaries are not prevented from paying privately for drugs that are not reimbursed by the government plan have to consider that many of the drugs not covered by government programs are often too expensive to afford without insurance or sufficient liquid assets. There are two reasons why many eligible beneficiaries of government insurance might not be able to obtain private insurance. First, government drug insurance can reduce the availability of private insurance by creating a disincentive to pay privately for something when a subsidized alternative is available from the state [Brown et al., 2006;

competing health-care options much different and can therefore create inappropriate incentives to consume inefficient medical care (because it receives a government subsidy) rather than more efficient care (because it does not receive a subsidy or, at least, a full subsidy). Drugs are the primary example of a medical technology that is demonstrably more efficient at improving health outcomes but which, due to the lack of comprehensive insurance coverage offered under government programs, is made comparatively more expensive, thus creating a disincentive for consumers (patients and physicians) to substitute it for less efficient treatment technologies. [7]

Lo Sasso and Meyer, 2006]. In Canada, even when government drug insurance benefits are less than what can be obtained in the private sector, the government program is perceived as a substitute because it is politically sold with the false promise of comprehensive coverage for all medically necessary goods and services.

Second, when people cannot opt out of the taxes paid to support the government health-insurance program, such taxes increase the effective price of obtaining private insurance because private insurance is paid for after taxes. The inability to opt out of paying taxes to fund the government program leaves less income available to pay for private insurance. In practical terms, people who do not have the financial liquidity to pay for private health insurance after paying taxes, but who would otherwise have the income before such taxes, are trapped in a program that does not adequately meet their needs.

[7] Research shows drug therapies are actually underused as cost-efficient substitutes because of flawed insurance designs [Kleinke, 2004].

Conclusion

At various times throughout the history of Canadian Medicare, the unsustainable growth in government health-care spending has been blamed on the cost of paying for physicians, hospitals, and medicines. This misguided focus on the components of health spending has led governments to rely on central planning to cap the supply of physicians [Esmail, 2005] and hold their wages below market rates [Skinner, 2002; Mullins, 2004]; to constrain hospital operating and capital resources [OHA, 2003]; and to restrict access to new technologies and treatments, leaving Canadian patients to go without the most advanced medical care available [Esmail and Walker, 2005; Skinner, 2005b].

But, it is a mistake for policy makers to engage in cost-containment strategies targeting the individual components of health-care spending. Unsustainable growth in health spending is a function of the flawed design of government health and drug insurance programs, not of the price of medical treatment or the introduction of new medical technologies. [8]

[8] Under a private insurance system, the limits of consumption and spending are constrained by the individuals' utility functions, their opportunity costs, and ultimately their resource limitations because private insurance incorporates the user-pay principle through deductibles, co-payments, and premiums. Thus, in a private market there is no such thing as "sustainability" but only consumer decision-making and tradeoffs. The term "sustainability" is only really useful in the context of government spending, which is constrained and not subject to the usual structure of utility maximization and tradeoffs that happen every minute of every day among countless individuals in the market. Because health care is a "luxury" good in the sense that economists use the term, as income rises, health spending rises faster as there is a greater amount of disposable income available after basic necessities. The problem is not spending growth or high levels of spending per se, but rather whether we can pay for that spending from government funds alone that is the key concern.

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About the authors

Brett J. Skinner

Brett J. Skinner is the Director of Health and Pharmaceutical Policy Research and of Insurance Policy Research at The Fraser Institute and works from the Institute's Toronto office. He is a Ph.D. candidate in Public Policy and Political Science, specializing in public policy, at the University of Western Ontario in London, Ontario, where he has lectured in both the Faculty of Health Sciences and the Political Science Department. He earned a B.A. through the University of Windsor in Windsor, Ontario, and an M.A. through joint studies between the University of Windsor and Wayne State University in Detroit, Michigan. He also spent a year working as a research consultant to the Insurance Bureau of Canada in Toronto. Mr Skinner's research has been published in many major papers, articles, and opinion editorials through The Fraser Institute in Vancouver and Toronto as well as the Atlantic Institute for Market Studies in Halifax, Nova Scotia. He appears frequently as an expert in the North American media and his research and opinions have been cited in media from around the world. So far in 2006, Mr Skinner has received over 30 invitations to present his research at government, academic, and industry conferences around the world and has testified about his research before the Canadian House of Commons Standing Committee on Health.

Mark Rovere

Mark Rovere is a Policy Analyst in the Department of Health and Pharmaceutical Policy at The Fraser Institute. Mr Rovere has an M.A. in Political Science from the University of Windsor.

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