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I was out for a walk a few days ago when I came across a billboard advertising a free laptop computer. I was intrigued but skeptical; there had to be some sort of catch. Sure enough, there was: the computer was free only with a three-year contract for internet services. In other words, the computer wasn't really free at all. I would still have to pay for it, albeit indirectly through the internet service fees.

This computer deal reminds me of the way we pay for most government services, which are financed through general tax revenues. Because we do not pay for them directly, many of these services—for example, roads and public schools—seem free, and it is often difficult for us to find out how much we are actually paying for them. This, in turn, makes it difficult for us to determine whether we are getting good value for our money.

This disconnect between government services and their true cost is particularly true of health care in Canada. Since a trip to the doctor or the hospital is free at the point of service, it is easy for consumers to greatly underestimate the cost of the care they receive.

So just how much do we really pay?

In 2008/2009, the provinces spent between 28.8% (Saskatchewan) and 46.4% (Ontario) of total available revenues on health care; all told, Canadian governments spent nearly \$121.6 billion of our tax dollars on publicly funded care ("How much do we really pay?" pg. 14). This means that the average unattached (single) Canadian paid approximately \$3,228 for public health care insurance, while an average family consisting of two adults and two children paid about \$9,100 for public health care insurance.

These spending levels are incredibly high—and growing unsustainably. Over the last 10 years, government health spending has outpaced revenue growth in six of the 10 provinces. If Ontario, for example, does not change its spending habits, health spending will consume 50% of all available revenues by 2014 and 75% of all revenues by 2038 ("Health care at a crossroads," pg. 10).

Considering how much Canadians spend on their health care system, one would expect us to have a world-class system. And yet wait times for treatment are far too long (16.1 weeks in 2009) and access to advanced medical technology is relatively poor.

These conditions are driving many Canadians to seek out health care elsewhere. In 2009, just over 41,000 Canadians received non-emergency medical treatment outside Canada, a notable increase over 2008 ("Leaving Canada for medical care," pg. 18).

Spending more public money on our health care system will not fix these problems. Statistical analysis shows that past increases in government spending on health care had no effect on reducing wait times ("Spend more, wait less?" pg. 16). This data is consistent with standard economic theory, which suggests that publicly financed systems are simply missing the appropriate economic incentives to direct resources to where they are needed.

Canadians must demand better. It's time for us to stop paying more while getting less.

KRISTIN FRYER (kristin.fryer@fraserinstitute.org)

Paying more, getting less

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How to beat Africa's health crisis

PHILIP STEVENS

Nearly 10 years after the UN's Millennium Development Goals were launched to great fanfare, many of the poorest countries remain in the grip of health crises (WHO, 2008). Though foreign aid for health care quadrupled between 1990 and 2007,¹ it has had an imperceptible effect on eradicating the diseases that most often afflict the poorest countries—diseases such as pneumonia, chest infections, HIV, and malaria. Predictably, a panoply of UN agencies and other aid agencies have responded to this failure with calls for even more increases in government health aid (Oxfam International, 2009b).

That the latest “big push” in foreign aid is failing to have much impact is unsurprising. Since the early 2000s, OECD governments have channelled increasing levels of funds—either bilaterally or via multilateral funding institutions—to governments in poor countries in the hope that these governments will then spend the money on improving health (Ravishankar et al., 2009). But this strategy is increasingly being exposed as a wasteful failure (Elliott, 2009, May 1). Thus, it is now time to examine other ways of delivering health care in poor countries—ways that do not rely entirely on dysfunctional governments.

Problems with state-run systems

Since becoming independent, many African countries have, for a variety of ideological and practical reasons, taken the position that the state should be the dominant provider of health care. Foreign donors have been keen supporters of this aspiration towards state-provided universal health care. Many Western government aid agencies and influential NGOs have sympathized with the view of many African governments that market-driven health care is impossible because of considerations such as “equity” and the fact that patients are likely to be taken advantage of by more knowledgeable medical practitioners

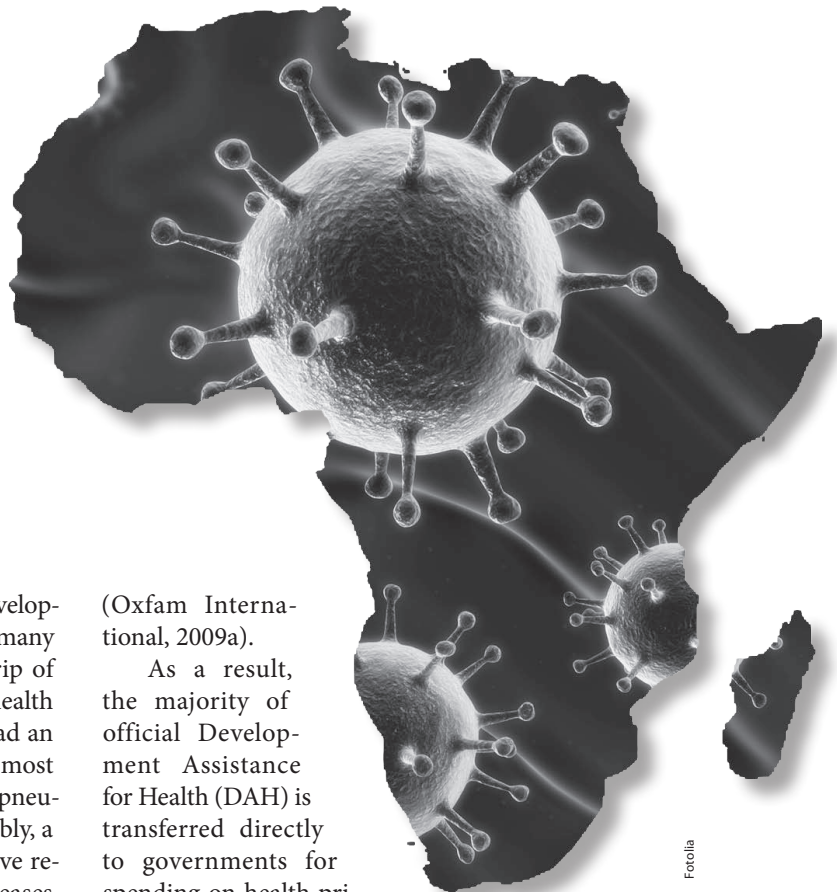
(Oxfam International, 2009a).

As a result, the majority of official Development Assistance for Health (DAH) is transferred directly to governments for spending on health priorities, either bilaterally or via multilateral bodies

such as the Global Fund to Fight AIDS, Tuberculosis and Malaria. In 2006, 10% of Africa's health spending was financed by foreign aid, and this figure is much higher in some countries (International Finance Corporation, 2007).

Unfortunately, this spending is not having much impact, as any visitor to the average state-owned clinic in Africa could attest. On a recent trip to Lagos, Nigeria, I visited a clinic that served a population equivalent to that of a London borough (around 1 million people). There were shortages of basic supplies such as bandages and sterile gauze and the clinic could supply no medicines. There was only one (exhausted) nurse employed full-time, who could often do no more than offer advice and reassurance to sick patients. This admittedly anecdotal experience is just one example among thousands of similar situations throughout the poorest countries. According to the World Health Organization, an estimated 30% of the world's population lacks regular access to existing drugs, and this figure rises to over 50% in the poorest parts of Africa and Asia (WHO, 2003).

Government-provided health care is in such a parlous state largely because local ministries of health do not have the capacity, expertise, logistical skills, or incentives to deliver a complex service like health care to every citizen. Many ministries are like bottomless pits in



Fotolia

terms of how they handle donations. Although advances in resource tracking within the health systems of developing countries have been made recently, many of these countries lack sufficient auditing procedures and public expenditure management systems (Powell-Jackson and Mills, 2007), making it extremely difficult for donors to see how their money has been spent.

This lack of financial accountability creates an environment in which corruption can thrive, particularly in countries that suffer from a weak rule of law. Health care systems in these countries are plagued by corruption, which can include direct embezzlement at the ministerial level, local medical staff selling “free” drugs on the grey market, institutionalized absenteeism, and illegal payments to health care personnel that allow patients to jump queues or obtain treatment (Lewis, 2006).

When some aid money does make it to local clinics, it is most often the educated urban classes who benefit, rather than the rural poor for whom the aid is really intended (Filmer, 2003). Because of these failings, the average cost of saving a life through government health care in less developed countries is US\$50,000 to \$100,000; in contrast, the cost of treating the most significant causes of child mortality is an estimated \$10 to \$4,000 per saved life in developing countries (Filmer and Pritchett, 1999). Children in these countries are not receiving cheap, life-saving treatments for diarrhoea (Oral Rehydration Therapy) and other basic interventions such as vaccinations, which can save lives for a few cents (Black, 2003).

A major problem with the current approach to foreign aid is that it focuses on inputs, rather than outputs. It is much easier, politically, for donors to tell their electorates about the number of mosquito bed nets and drugs they have paid for, and the amount of money they have disbursed, while paying less attention to the results achieved through that money. Recent external evaluations of the Global Fund and the United States Agency for International Development have shown that while they have been good at disbursing funds, neither body could provide any substantive evidence that the disease burden of poor countries had declined because of their activities (US GAO, 2007; Global Fund, 2009).

The current state-centric model of delivering health care is clearly not working. As William Easterly (2006), author of *The White Man's Burden*, put it, “The status quo—large international bureaucracies giving aid to large national government bureaucracies—is not getting money to the poor.”

Rethinking foreign aid

Since most OECD countries remain committed in principle to spending 0.7% of their GDP on foreign aid, it is

now time for policy makers to radically rethink the way this money is spent. Fortunately, an alternative to the current system already exists in the form of an enormous and diverse private sector within Africa and other lower-income regions.

According to International Finance Corporation and World Bank figures, between one-third and one-half of the US\$16.7 billion spent on health care in sub-Saharan Africa in 2005 was spent in the private sector, often by the poorest people who cannot get government services (International Finance Corporation, 2007). In Madhya Pradesh, India, 75% of all health care is provided by the private sector (De Costa and Diwan, 2007). This huge capacity is generally ignored by donors, who for ideological reasons prefer to work directly with governments. Meanwhile, these same governments do next to nothing to harness this massive capacity, leaving the poor to pay for health care out of their own pockets.

Donors could make a real difference by using their money to offer competitive contracts for the delivery of health services. Non-profit groups, governments, and, crucially, the private sector should all be competing to deliver a wide range of services, such as primary care and hospital management. This competitive stimulus would give health care providers a powerful incentive to improve standards and drive down costs, and would be far more effective than simply subsidizing state-run health care. Ministries of health would then have the resources to concentrate on activities for which government is better qualified, such as standard-setting, monitoring, and regulation.

This has already happened in Cambodia, where NGOs have competed to provide health services to the rural poor since 1999, after the near destruction of the health system during the civil war. Under private delivery, immunization coverage rose from 19% to 40% and equity was improved (Schwartz and Bhushan, 2004). Coverage and standards have improved so rapidly that the government has expanded the program to cover one in 10 Cambodians.

In 2005, *The Lancet* published a review comparing 10 different contracting programs around the world and found that most private contractors out-performed the government in cost, quality, and coverage. In a number of countries, including Bangladesh, Guatemala, Haiti, India, Bolivia, Madagascar, and Senegal, contracting with non-governmental entities resulted in “rapid improvements” (Loevinsohn and Harding, 2005). The practice of using public money to fund private delivery of health services is not new and has long been in place in socially democratic countries such as Norway and Sweden.

This practice is particularly effective at helping to reduce the inequity that often results from monopolistic government provision. Many of the communities

most under-served in state-run systems are both poor and rural. Contracts could be framed in such a way as to target specific geographical areas, and be loaded to give specific benefits to providers that serve poorer socio-economic groups. Once a headache for bureaucrats in health ministries, the poor could suddenly provide a business opportunity.

Inevitably, there has been much opposition to these developments, mainly from ideological opponents of the private sector such as Oxfam International (2009a). Their main argument is that public systems are better suited to provide equitable health care and that relying on the private sector is risky and unproven. Nevertheless, for the last 50 years, their favoured model of state-provided health care has failed. It is time to try something new.

Fortunately, the world is moving on quickly and a formal resolution on the role of the private sector was nearly included in this year's World Health Assembly in Geneva, until it was sidelined by more pressing discussions about swine flu. If major aid agencies such as the Canadian International Development Agency get behind this development, it could transform the way we spend foreign aid. For too long, aid has been wasted by governments. Contracting to the private sector may mean that we will finally see some results.

Note

1 Official Development Aid for Health (DAH) increased from US\$5.6 billion in 1990 to US\$21.8 billion in 2007 (Ravishankar et al., 2009).

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CREATIVE DESTRUCTION

NICK SCHULZ

Creative destruction refers to the manner in which free markets tend to replace certain products and processes with higher quality products and more efficient production methods. Capitalism creates new ways of doing things and in the process destroys the old ways.

The phrase “creative destruction” was first popularized by Joseph Schumpeter, an economist. He developed the notion in his book *Capitalism, Socialism and Democracy* (1942/2008) in a six-page chapter titled “The Process of Creative Destruction.” Schumpeter laboured for much of his career to explain the fundamental nature of capitalism and the market economy. The process of creative destruction was, in Schumpeter’s view, capitalism’s “essential fact”:

The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as US Steel illustrate the same process of industrial mutation—if I may use that biological term—that increasingly revolutionizes the economic system

from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in.

When Schumpeter popularized this phrase, politicians, economists, and the public were very concerned about monopolies and concentrated economic power. Industrial-scale capitalism was not very popular around the world during the 1930s and 1940s. Schumpeter was trying to focus attention on the essentially dynamic character of capitalism and the futility of examining it at a single point in time.

In Schumpeter’s view, a firm’s economic strength emerges over time and from continued technological advancement and organizational restructuring. Creative destruction means that the establishment of new techniques,

business models, technologies, and markets can destroy an established monopolist’s dominant position.

For Schumpeter, the entrepreneur is the oft-overlooked heart of the economic system. Through the “element of personal initiative,” the entrepreneur is able to unleash “the perennial gale of creative destruction” that propels economies forward, brings new technology to the market, and saps established firms of their economic power.

Schumpeter took great pains to describe the defining characteristics of the capitalist system so as to explain its benefits: generating wealth, innovation, and new products. The dynamic itself was important, not just the end result. For Schumpeter, the order of the word couplet—“creative” followed by “destruction”—was significant. Creativity preceded destruction. Destruction occurs only after generative acts yield innovations and technological advances. For this reason, Schumpeter believed that the destruction inherent to the capitalist system was a worthy price to pay for economic progress.



KEY CONCEPTS

As Schumpeter biographer Thomas K. McCraw has pointed out,

history contains many examples of leaders who have tried to reverse the sequence, believing that destruction could give rise to creativity. During the Cultural Revolution in China in the 1960s, Mao Zedong exhorted the revolutionaries to “destroy first, and construction will look after itself.” The economic (and human) consequences of following this logic ultimately proved disastrous.

Schumpeter knew that this process of creative destruction would give rise to enmity among competitors. Incumbent firms would feel threatened by new technologies and new ways of doing business. These firms would likely appeal to the government to prevent new creations that could threaten their economic power from coming to the market.

While the significance of Schumpeter’s analysis of capitalism was under-appreciated in his own day, he has enjoyed a kind of rediscovery over the last quarter century. Today, “creative destruction” is a well-known phrase that is used



Fotolia

to describe the economic dynamism that is most closely associated with the American economy but is also evident around the world.

In hindsight, it is rather easy to see Schumpeterian creative destruction in action. During the twentieth century, horse-drawn carriages gave way to automobiles; telegraphs gave way to telephones. Today, we can see creative destruction most clearly in the technology industry as entrepreneurs create new technologies that destroy previous ways of doing business. Not long ago IBM's dominance in computers was undermined by Microsoft and its personal computing technologies. Today, Microsoft's dominance is challenged by the innovations of Google and other firms we have not heard of yet.

But if it is easy for us to comprehend creative destruction today it is largely due to the analytical lens Schumpeter brought to the study of dynamic capitalism. Building on Schumpeter's insights, scholars are now extending his analysis to make our understanding of capitalism more complete. For example, Columbia University's Amar Bhidé has documented the process of "nondestructive creation" at work in modern capitalist systems. According to this view, new products and technologies are often used to satisfy new wants and desires and do not immediately displace existing goods and technologies. For example, "thirty years ago, the only diagnostic techniques that people used to use were X-rays," Bhidé notes. "We still use a lot of X-rays. But then we had CT scans, then PET scans, and now we have MRIs. And with each of these innovations, we now can diagnose diseases that you wouldn't have been able to diagnose previously. So it's not that MRIs simply substituted for X-rays. In fact, most MRIs are used to do things that X-rays could not do. An X-ray could not show you a tumor in your back because of the soft tissue. So an MRI is largely an example of nondestructive creation."

While creative destruction can reduce the demand for labour in certain areas, it does not lead to widespread and abrupt spikes in unemployment. Significant innovations are refined and perfected over time, which gives the labour market time to adjust and adapt accordingly. For example, kerosene replaced whale blubber as a lantern fuel, but it did not put whalers out of business overnight. Similarly, the first personal computers did not immediately replace typewriters. Because replacing an existing product and method of business with a new one is expensive, transitions happen over time.

We see creative destruction happening all the time, but we must remember that new innovations may only change relative market share rather than absolute demand for a specific product or service. Bhidé provides one example of this phenomenon:

Over 30 years after the introduction of minicomputers and more than 20 years after the introduction of microcomputers, the mainframe remains an important category. Total worldwide revenues of large-scale computer processors (or mainframes) amounted to \$16 billion in 1997 compared to \$16.2 billion in 1982. But because total demand grew from \$38 billion to \$183 billion, mainframes' share of the total computer market dropped considerably, from 42% to about 9%.

Other examples abound. The development of the internet has pressured traditional newspapers but has not destroyed them overnight. Laser eye surgery has satisfied many customers but eyeglass shops are still prevalent. Recent scholarship such as Bhidé's provides a more nuanced view of Schumpeter's important insight that capitalism is a dynamic and evolutionary process.

Suggestions for further reading

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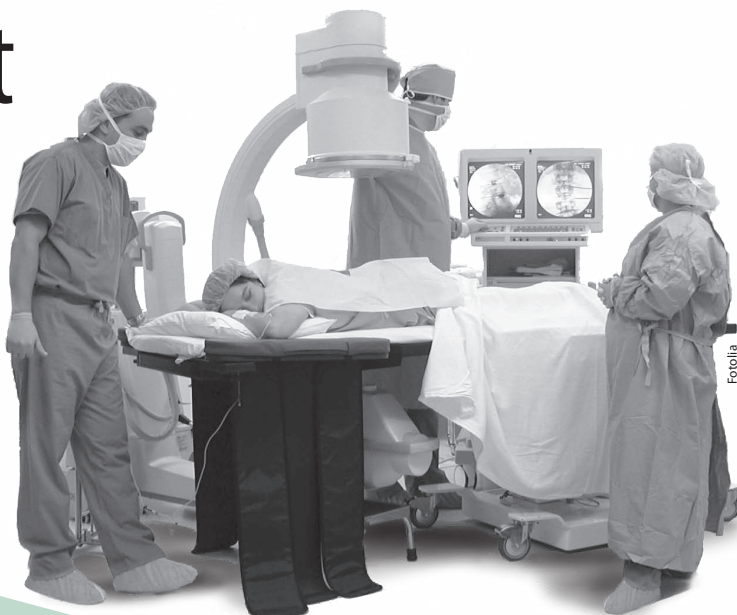
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Please join us on February 25 at 11:00 am Pacific time for an online discussion of this essay with Nick Schulz.

Health care at a crossroads

Will Ontario taxpayers continue to pay more and get less?

MARK ROVERE AND BRETT J. SKINNER



The recession has left Ontario's finances in a state of disarray; its Ministry of Finance is projecting a record deficit of \$24.7 billion for the 2009/2010 fiscal year (Canadian Press, 2009, Oct. 22). Tax increases and/or cutbacks in public goods and services appear to be inevitable. This spells trouble for Ontario's public health care system, which was financially unsustainable even before the recession began. On the other hand, the dismal financial situation in the province has created an optimal opportunity for Ontario to introduce significant health care reforms.

The most recent data show that over the last 10 years (1999/2000 to 2008/2009) provincial government health expenditures grew at an average annual rate of 7.3% (Statistics Canada, 2009). At the same time, gross domestic product (GDP) in Ontario grew at an average annual rate of only 4.5%, while the province's total available revenue from all sources (TAREV) grew at an average rate of 5.6% annually (Statistics Canada, 2009). This is problematic because it means that government spending on health care has consistently grown faster than the province's ability to pay for it.

The Ontario government is quickly running out of money. Last year (2008/2009), government health expenditures in Ontario accounted for 46.4% of TAREV (Statistics Canada, 2009). Figure 1 shows that, based on the most recent 10-year trends in government health care spending and total available revenue, provincial health care expenditures will consume 50% of TAREV by 2014 and 75% of TAREV by 2038 if Ontario does not change the way in which it currently finances health care (Skinner and Rovere, 2009).

Figure 1 also shows the years in which government health care spending will consume 75% and 100% of total "own-source" revenue—the revenue the province

generates for itself primarily through taxes, excluding revenue transferred from other provinces or from the federal government. These projections indicate that if Ontario does not significantly restructure the way it finances health care, then health care spending will consume 75% and 100% of the province's own-source revenue by 2019 and 2030, respectively.

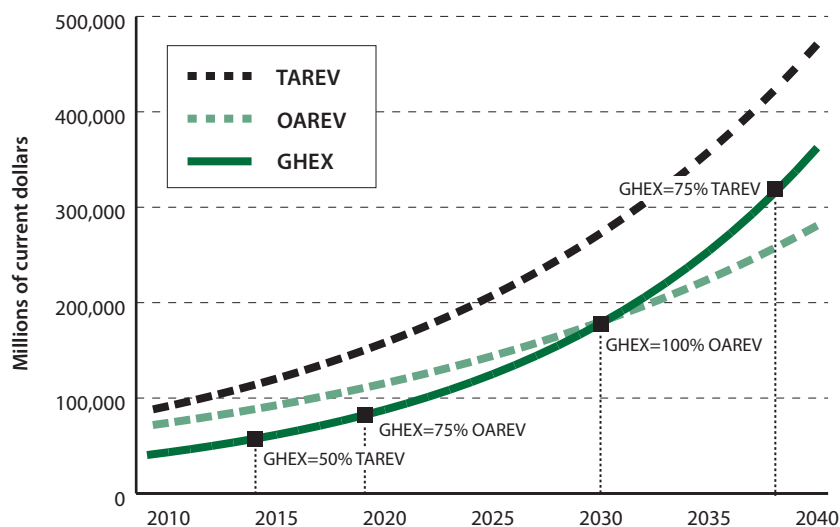
Recent economic circumstances have made the situation much worse than indicated in figure 1. The most recent one-year trend data show that government health expenditures in Ontario are on pace to consume 50% of all provincial revenue by this year (2010) (Skinner and Rovere, 2009).

As health care costs consume a larger share of provincial revenues, spending on other government services will have to be reduced. The alternative is to reduce health care funding in order to preserve funding for other government services. Yet, Ontario has banned private sources of funding for health care. This means that, in the absence of meaningful reform, the government can only address the problem by raising taxes, cutting health care services, or both. Neither would be good for Ontario's patients and taxpayers.

The reality is that if the province does not legalize private health care financing, then we will quickly find ourselves reliving the 1990s when severe cutbacks in health care spending were made in an attempt to control spiralling costs. Wait times increased, the availability of medical technology declined, and it became more difficult for Ontarians to find a regular family physician (Esmail and Walker, 2008; Chan, 2002).

If the Ontario government continues to be the sole funder and provider of health care, then Ontarians can expect to pay more for their health care services in the future while getting much less in return. Governments

Figure 1: Ontario – projected government health expenditures (GHEX), total available revenue (TAREV), and total available own-source revenue (OAREV), based on 10-year trends in GHEX, TAREV, and OAREV, 1999/2000 to 2008/2009



Source: Skinner and Rovere, 2009.

must stop using health care as a political pawn and should introduce sound incremental reforms that will improve the sustainability of our health care system.

The province should require flat percentage-based co-payments for all publicly funded medical goods and services.¹ Ontario should also recognize the right of patients to pay for and be insured privately for all types of medical goods and services. Finally, medical providers (for-profit and non-profit) should be allowed to compete for the delivery of publicly insured health services. By taking advantage of for-profit and non-profit health service providers in the private sector, the province would be able to reduce government health expenditures while improving medical care. Medical providers would have the necessary incentives to compete both on price and service, inevitably benefiting both taxpayers and patients.

These policies are consistent with existing practice in most European countries (Esmail and Walker, 2008). Further, economic research shows that cost-sharing² reduces health care expenditures without causing adverse health outcomes, as long as individuals with chronic conditions (especially those who are poor) are exempt from paying for certain preventative medical services out of pocket (Newhouse et al., 1993).

Taking advantage of market incentives by making patients directly responsible for a portion of their publicly funded health care costs will ease health care inflation. Moreover, legalizing private insurance options for health care will allow patients to have control over their medical

insurance benefits and will shift costs off taxpayers.

Under its current structure, Ontario's health care system is financially unsustainable. Unless patients and providers are given appropriate incentives such as cost-sharing, we can expect Ontario's health care services to continue to deteriorate.

Notes

1 Instead of a fixed user fee for medical services, a percentage-based co-payment (also referred to as "co-insurance") provides patients with the price signals they need to choose between various treatments. As a result, the allocation of medical resources will follow demand instead of a centrally planned formula.

2 The Rand Health Insurance Experiment used multiple types of cost-sharing mechanisms and found that co-insurance (percentage-based co-payments) had the most significant effect on reducing utilization.

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The benefits of congestion pricing

CHARLES LAMMAM

If you drive regularly or commute to work, you have likely experienced road congestion. Road congestion not only causes frustration among drivers, but it also costs the economy in terms of lost time and unnecessary transportation costs, which are borne by both individuals and businesses. In Canada, the total annual cost of congestion in major urban areas is estimated to be between \$2.3 billion and \$3.7 billion (in 2002 dollars), with more than 90% of that cost coming from the value of lost time for drivers and passengers (Transport Canada, 2006). Fortunately, there is a way to allocate scarce road space more efficiently and reduce the costs of road congestion: making use of the price system.

Many economists have long advocated congestion pricing to reduce road congestion because it gives drivers an incentive to change their behaviour. With congestion pricing, drivers pay a fee to use a road, usually in the form of a toll, which varies according to the time of day the road is used. For instance, drivers pay a higher fee during peak periods when road capacity is scarce (i.e., during rush hour) and a lower fee during non-peak periods when capacity is in excess (i.e., in the late evening). When faced with paying a fee, fewer drivers use the road during peak periods and congestion is reduced.

Congestion fees (tolls) no longer need to be collected at toll booths as modern toll systems collect fees electronically, requiring no stoppages in traffic. Vehicles are outfitted with wireless radio frequency transponders that are read by overhead antennas that detect and bill drivers according to use. Drivers without a transponder get their license plate photographed and receive a bill in the mail, which typically requires them to pay a higher fee.

A number of studies confirm the effectiveness of congestion pricing. A recent report by the Congressional Budget Office (CBO), the US agency that reviews congressional budgets and other legislative initiatives with budgetary implications, provides a comprehensive evaluation of congestion pricing. The report, which examines both the benefits and challenges of congestion pricing, is important because it draws conclusions based on real-world



evidence rather than theory. The evidence summarized by the CBO comes from several reputable sources and is based mainly on the results of congestion pricing in London, New York, New Jersey, California, and Minnesota. The report found that congestion pricing reduces congestion,¹ shortens travel times, makes travel times more consistent, and increases the efficient use of highway capacity.

For example, congestion pricing in London reduced traffic within the Central London charging zone by 15% and reduced congestion by 30%. Congestion pricing also reduced travel times for trips entering and exiting the congested zone by 14% and reduced the variability of trip times by 30%.² All told, London's congestion pricing scheme produces benefits to society amounting to an estimated US\$122 million per year (net of costs).³

Congestion pricing has also been successful in the United States. Following the introduction of congestion pricing, traffic in the peak morning period on the bridges and tunnels of the Port Authority of New Jersey and New York declined by 7%, while traffic in the peak afternoon period fell by 4%. Similarly, traffic and travel times on California's State Route 91 declined after congestion pricing was instituted. After accounting for the value of drivers' travel time, congestion pricing on Route 91 reduced congestion enough to generate a net savings of more than US\$2 per trip. These savings amount to an estimated US\$12 million per year (net of costs) in benefits to society.⁴

The CBO noted that nationwide implementation of congestion pricing in the United States could provide annual benefits to society (net of costs) estimated conservatively at US\$19 billion.⁵ In addition, calculations by the US Department of Transportation suggest that widespread

implementation of congestion pricing could reduce the amount of investment needed to maintain the US highway system at its current physical condition and operational performance by more than 25% (Department of Transportation, Federal Highway Administration, 2007).

While congestion pricing has the potential to produce substantial benefits, some challenges may impede its adoption, including concerns about the unequal distribution of benefits and costs among low- and high-income drivers,⁶ increased congestion on other (non-priced) roads, and the high cost of building and operating congestion pricing systems. However, the CBO found that many of these concerns are either misplaced or can be mitigated.

For example, despite the argument that congestion pricing hurts low-income drivers, the CBO's summary of the findings of public opinion surveys indicates broad levels of support for congestion pricing across all income groups in areas where it has been introduced. The surveys also show that the public prefers tolls over tax increases for the funding of new roads.

While not discussed explicitly by the CBO, tolls provide an important revenue stream to fund and maintain new transportation infrastructure, making it possible to increase road capacity. However, in situations where tolls are added to existing infrastructure, governments should ensure that taxes are reduced by an equal magnitude to avoid double-charging drivers. That way drivers can decide voluntarily whether to pay for the privilege of using a particular road.

The concern that congestion pricing increases congestion on alternative (non-priced) routes appears misplaced. The CBO report points to studies finding that drivers generally changed their travel decisions in response to congestion pricing without increasing congestion at alternative times or on alternative routes or modes.

Finally, to mitigate the concern about the high cost of administering and collecting congestion fees, the CBO recommended the use of interoperable electronic fee collection systems. Interoperable systems would allow drivers to use a single transponder for multiple electronic toll collection systems. This would facilitate coordination and allow different systems to operate together without imposing high costs on users.

Overall, the CBO's report suggests that congestion pricing is an effective tool for reducing traffic congestion. The significant benefits of using the price system to allocate road space include reduced congestion, shorter and more consistent travel times, and more efficient use of highway capacity. Importantly, congestion pricing can save people and businesses the cost of time lost while drivers are stuck in traffic. Since the practical challenges impeding the adoption of congestion pricing are relatively minor and can be overcome, perhaps it's time to seriously consider expanding the use of congestion pricing in Canada.

Notes

1 The CBO noted that a 10% increase in a congestion fee generally reduces traffic congestion by up to 5% and shifts traffic away from the periods with the highest charges.

2 The reduction in the variability of travel time is especially important since highway users place a high value on reliable travel time. In some cases, the value they place on reliable travel time may be greater than the value they place on reductions in travel time (CBO, 2009).

3 The estimated net social benefit of congestion pricing in Central London accounts for the cost incurred by people who are inconvenienced by the congestion charge and switch to public transportation as a result.

4 Regarding California's Route 91, the CBO does not state whether the net social benefit calculation accounts for the costs incurred by people who are diverted from the priced roadway.

5 This conservative estimate of the net social benefit of nationwide implementation of congestion pricing in the US compares the economic benefits due to time savings and reduced accidents to the loss of economic value to highway users who are diverted to other times of day, other routes, or other modes, as well as the costs of toll collection and administration.

6 Since a given congestion fee represents a larger proportion of income for a low-income driver than for a high-income driver, these fees are said to be regressive. However, this argument also applies to other forms of highway user fees such as fuel taxes, which can be even more inequitable. With fuel taxes, lower-income people often fund the mobility of higher-income people. Higher-income individuals are more likely to be able to afford new, better-mileage cars and will therefore pay less gasoline tax. People who are less able to afford a newer, more fuel-efficient car end up subsidizing those higher-income individuals. In addition, with fuel taxes, automobile drivers end up subsidizing the mobility of for-profit trucking firms who impose most of the wear on highways.

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How much do we really pay?

The price of public health insurance

NADEEM ESMAIL AND MILAGROS PALACIOS



Canadians often misunderstand the true cost of their public health care system. This is partly because health care consumption is free at the point of use, leading many to grossly underestimate the actual cost of the care delivered. Furthermore, health care is financed through general government revenues rather than through a dedicated tax, further blurring the true dollar cost of the service. In addition, health spending numbers are often presented in aggregate, which results in a number so large that it becomes almost meaningless to the average Canadian. For instance, consider that nearly \$121.6 billion of our tax dollars was spent on publicly funded health care in 2008/2009 (Statistics Canada, 2009b). If Canadians understood the true cost of their publicly funded health care system, they would be able to better assess whether they were receiving

value for their money.

A more informative measure of the cost of our health care system is health spending on a per capita basis. The \$121.6 billion spent on health care in 2008/2009 works out to approximately \$3,650 per Canadian. This would be the cost of the public health care insurance plan if every Canadian resident paid an equal share. But some Canadians are children and dependents and thus are not taxpayers, and Canadians certainly do not pay equal amounts in taxes each year. Given the nature of our tax system, higher income earners bear a greater proportion of the tax burden than lower income earners and thus contribute proportionally more to our public health care system.

In order to more precisely estimate the cost of public health care insurance for the average Canadian family in 2009, we must determine

how much tax an average family pays to all three levels of government. The percentage of the family's total tax bill¹ that pays for public health insurance is then assumed to match the share of total government tax revenues (including natural resource revenues) dedicated to health care (24.5% in 2008/2009) (Statistics Canada, 2009a, 2009b; calculations by authors). Table 1 shows six Canadian family types, the estimated average income for those family types in 2009, and their estimated dollar contribution to health care.

In 2009, the average unattached (single) individual, who earned slightly less than \$35,000, paid approximately \$3,228 for public health care insurance. An average Canadian family consisting of two adults and two children (earning a little more than \$104,100) paid about \$9,100 for public health care insurance.

Table 2 divides the Canadian population into 10 income groups (deciles) to show what families from various income brackets paid for public health care insurance in

2009. According to this calculation, the 10% of Canadian families with the lowest incomes paid an average of about \$403 for public health care insurance. The 10% of Canadian

families who fall into the fifth decile (who earn an average income of approximately \$50,432) paid an average of about \$4,451 for public health insurance. The families among the top 10% of income earners in Canada paid about \$26,476.

The costs of public health care insurance presented in tables 1 and 2 are a clear departure from the per capita figure of \$3,650 given earlier. Our hope is that these figures will provide Canadians with a clearer picture of just how much they pay for public health care insurance. With a more precise estimate of what they really pay, Canadians will be in a better position to decide whether they are getting a good return on the money they spend on health care.

Table 1: Average income and average total tax bill of representative families, 2009*

Family type	Average cash income	Average total tax bill	Tax rate	Health care insurance
Unattached Individuals	\$34,982	\$14,543	41.6%	\$3,228
2 Parents, 0 Children	\$85,548	\$39,857	46.6%	\$8,847
2 Parents, 1 Child	\$102,003	\$40,171	39.4%	\$8,917
2 Parents, 2 Children	\$104,131	\$41,058	39.4%	\$9,113
1 Parent, 1 Child	\$40,475	\$11,980	29.6%	\$2,659
1 Parent, 2 Children	\$43,699	\$12,563	28.7%	\$2,788

* Preliminary estimates

Source: The Fraser Institute's Canadian Tax Simulator, 2009.

Table 2: Average income and total tax bill in each decile, 2009*

Decile	Average cash income	Average total tax bill	Tax rate	Health care insurance
1	\$11,582	\$1,818	15.7%	\$403
2	\$24,167	\$4,823	20.0%	\$1,071
3	\$32,488	\$9,152	28.2%	\$2,032
4	\$41,031	\$14,513	35.4%	\$3,221
5	\$50,432	\$20,054	39.8%	\$4,451
6	\$62,197	\$25,702	41.3%	\$5,705
7	\$76,042	\$32,623	42.9%	\$7,241
8	\$93,502	\$39,875	42.6%	\$8,851
9	\$118,520	\$51,781	43.7%	\$11,494
10	\$223,632	\$119,278	53.3%	\$26,476

* Preliminary estimates

** Deciles group families from lowest to highest incomes with each group containing 10% of all families. The first decile, for example, represents the 10% of families with the lowest incomes.

Source: The Fraser Institute's Canadian Tax Simulator, 2009.

Note

1 The total tax bill includes income taxes (personal and business), property taxes, sales taxes, profit taxes, health, social security and employment taxes, import duties, license fees, taxes on the consumption of alcohol and tobacco, natural resource fees, fuel taxes, hospital taxes, and a host of other levies.

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Spend more, wait less?

BACCHUS BARUA AND NADEEM ESMAIL

Despite the economic downturn, health care spending grew nearly 5% per Canadian between 2008 and 2009, according to estimates by the Canadian Institute for Health Information (CIHI, 2009a). Some Canadians may believe that increasing health spending will protect or even improve their access to health care services, but a closer look suggests that they are mistaken.

Past research on the relationship between public health expenditures and wait times for health care in Canada suggests that either no relationship exists or that a positive relationship exists where more spending is related to longer wait times.

Martin Zelder first examined the relationship between health expenditures and wait times in a study published in 2000. His analysis examined wait times and public expenditures between 1993 and 1998 and controlled for the percentage of elderly persons in the population, per capita disposable income, the political party in power, and the frequency of health sector strikes. His analysis revealed that provinces that spent more on health care per person had neither shorter nor longer weighted median wait times than provinces that spent less. In addition, provinces that spent more did not have higher rates of surgical specialist services (consultations plus procedures) and actually had lower rates of procedures and major surgeries (for the complete results of this analysis, see Zelder, 2000).

A follow-up study in 2003 using a similar methodology (controlling for the elderly population and GDP) found that increased health expenditures were actually correlated with increases in wait times, unless those spending increases were targeted at physician or pharmaceutical expenditures, in which case increased health expenditures

were correlated with decreases in wait times¹ (Esmail, 2003).

As several years have passed since these studies were published and notable reductions in wait times have occurred in some provinces in recent years, it is worthwhile to revisit the relationship between wait times and spending to determine if the addition of several years of data leads to different conclusions.

Revisiting these studies involves comparing total wait times for health care, published in the Fraser Institute's annual *Waiting Your Turn* surveys, with public expenditures on health care in Canada from 1993 to 2009,² using a statistical technique known as regression analysis. In addition to the comparison of wait times and health expenditures, our analysis controls for the effects of GDP and the age of the population on wait times. Increases in income (i.e., GDP) can be expected to increase the demand for health care services and thus to have some effect on wait times. Similarly, the impact of natural deterioration on health care demand (i.e., older people require more care) can be expected to have some effect on wait times. The regression analysis also controls for the effect of last period waiting

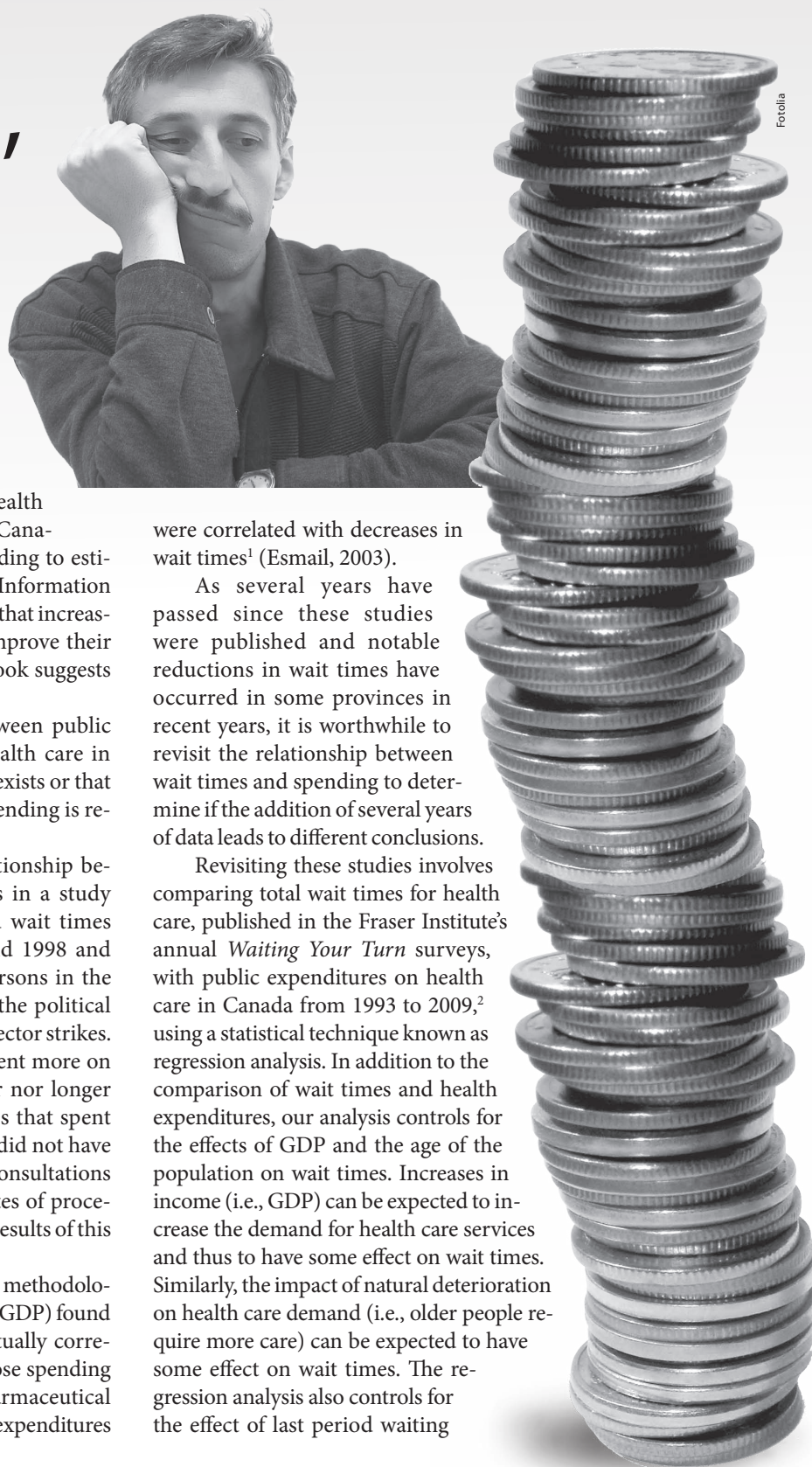


Table 1: Variables

Variable	Definition
TWAIT	Total waiting time from referral by GP to treatment (weeks)
TS	Total public health expenditure per capita (\$1997)
PS	Public physician spending per capita (\$1997)
P65	Proportion of provincial population over the age of 65 (%)
AR(1)	Total waiting time in the previous year
RGDP	Real GDP per capita (\$1997)

time on current period waiting time.³ Table 1 gives a complete list of the variables used in this analysis.

The results of the basic regression analysis, presented in table 2, offer some interesting insights into the function and management of the health care system. The most important observation is that when public health care spending increases by \$396 per capita,⁴ wait times increase by one week. However, given that this coefficient passes the 10% level of significance (statistically speaking, we can be 90% certain that this finding is not due to chance) but not the stricter and more commonly used 5% level of significance (95% certain), it is more conservative to argue that increases in total health care spending appear to have no effect on wait times.

Separating the effect of health expenditures on physicians from that on health care generally does not alter this finding.⁵ Indeed, this second regression analysis, shown in table 3, finds that an additional \$156 of per capita expenditure not spent on physicians will actually result in a one-week increase in wait times, a finding that is statistically significant at the 5% level. However, an additional \$57.76 spent on physicians will result in a one-week reduction in wait times.⁶

This disconnect between health expenditures and access to health care services is not unique to the analysis presented here or to previous reports by Esmail and Zelder. Indeed, the Canadian Institute for Health Information found (not including Quebec) that in 2007-2008, "Age-standardized rates of surgery outside the priority areas [hip & knee replacements, cataract surgery, cardiac revascularization, and cancer surgery] are about the same as they were in 2004-2005" (2009b: 12). Within the

**Table 2: Regression results
Dependent Variable: TWAIT**

Variable	Coefficient	T-Statistic
C	0.426187	0.027817
TS	0.002527	1.666514*
RGDP	8.58E-05	0.577240
P65	0.692271	0.875946
AR(1)	0.818335	9.904563**

Details and weighted statistics:

Adjusted R-Squared, 0.797040

Method: Pooled EGLS (cross-section weights)

Total pool (balanced) observations: 150 (15 years x 10 provinces) We lose 1 year due to the inclusion of the AR(1) term.

White cross-section standard errors and covariance (d.f. corrected)

* This variable is significant at the 10% level.

** This variable is significant at the 5% level.

**Table 3: Regression results
Dependent Variable: TWAIT**

Variable	Coefficient	T-Statistic
C	-2.115529	-0.168238
TS-PS	0.006402	3.860793**
PS	-0.017312	-2.520425**
RGDP	8.75E-05	0.670227
P65	0.974542	1.449657
AR(1)	0.764481	9.094601**

Details and weighted statistics:

Adjusted R-Squared, 0.809992

Method: Pooled EGLS (cross-section weights)

Total pool (balanced) observations: 150 (15 years x 10 provinces) We lose 1 year due to the inclusion of the AR(1) term.

White cross-section standard errors and covariance (d.f. corrected)

** This variable is significant at the 5% level.

continued on page 26

Leaving Canada for medical care

NADEEM ESMAIL



In recent years, a number of companies aiming to provide Canadians with easier access to medically necessary treatments outside Canada have appeared in Canada and elsewhere. Of course, leaving Canada for medically necessary treatment is nothing new—Canadians have been doing so for many years, either in response to the unavailability of certain treatments in Canada or in response to long wait times for medically necessary treatment. This has left many wondering exactly how many Canadians receive treatment outside Canada each year.

While data on this topic are difficult to come by, it is possible to estimate the number using the results of the Fraser Institute's *Waiting Your Turn* survey and the counts of procedures completed each year in Canada, which are provided by the Canadian Institute for Health Information (CIHI).¹ While the computations below are approximate, they are the most complete estimates available in Canada today, and they should provide some insight into how many Canadians are choosing to seek care outside Canada. The calculations also provide some

insight into the number of Canadians who might choose to stay in Canada and pay for treatment in their home province, if only that province's government would deviate from the status quo and allow them to do so.

Methodology

Each year, the Fraser Institute's *Waiting Your Turn* survey asks physicians across Canada, in 12 major medical specialties, the question, "Approximately what percentage of your patients *received* non-emergency medical treatment in the past 12 months outside Canada?" (emphasis in original). The answers to this question are averaged for each of the specialties studied in *Waiting Your Turn* for each province, producing a table that reports the average percentage of patients receiving treatment outside Canada (Esmail, 2009: table 11). In 2009, 1.0% of all patients in Canada were estimated to have received non-emergency medical treatment outside Canada, an increase from 0.8% in 2008.

Combining these percentages with the number of procedures performed in each province and in each medical specialty gives a rough estimate of the number of Canadians who actually received treatment outside Canada. Two data-related issues must be noted before discussing the estimate. First, the number of procedures performed in Canada is not readily available from the Canadian Institute for Health Information (CIHI). Notably, Alberta and Quebec do not provide complete discharge abstract data (DAD) to the CIHI, which is the source for the procedures counts data used in *Waiting Your Turn*. The authors of *Waiting Your Turn* address this concern by making a pro-rated estimate of procedures using older hospitalization data. These estimated procedure counts fill in for the actual number of procedures in Alberta and Quebec.

Second, there is a temporal mismatch between the timing of the Fraser Institute's *Waiting Your Turn* survey and the CIHI's annual DAD release. Specifically, procedure counts data used for *Waiting Your Turn* are typically one year behind (e.g., the 2009 edition of *Waiting Your Turn* used procedure counts from 2007/2008). While the



calculation below uses the temporally mismatched procedures counts to provide up-to-date information, previous calculations adjusting for the temporal mismatch show that it does not appear to materially affect the trend witnessed in the overall count of Canadians. However, it does, as expected, affect the actual counts of Canadians (Esmail, 2007).²

The counts of the number of patients receiving treatment outside Canada each year that are produced by this methodology are likely to underestimate the actual number of patients being treated outside Canada. This is the result of a few factors. First, and most importantly, these numbers are based on specialist responses, which means that patients who leave Canada without consulting

Table 1: Estimated number of patients receiving treatment outside Canada, 2009

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic surgery	33	34	3	0	80	49	6	73	0	0	279
Gynaecology	136	90	72	33	1,701	214	15	0	5	35	2,300
Ophthalmology	517	498	40	0	1,182	961	123	0	—	19	3,341
Otolaryngology	115	276	0	47	465	277	10	5	—	0	1,194
General surgery	1,190	625	102	25	2,216	1,391	11	80	0	0	5,638
Neurosurgery	128	0	—	0	408	97	16	0	—	—	648
Orthopaedic surgery	196	226	25	24	1,355	149	21	27	3	11	2,038
Cardiovascular surgery	55	57	99	—	96	92	0	0	0	—	399
Urology	599	412	0	26	2,064	438	23	110	—	54	3,727
Internal medicine	382	776	22	216	1,945	857	33	70	0	82	4,383
Radiation oncology	6	16	—	0	82	11	15	—	—	1	132
Medical oncology	87	80	—	—	191	74	11	4	0	—	448
Residual*	1,883	2,264	344	307	8,725	2,305	213	231	7	197	16,478
Total	5,327	5,354	707	678	20,510	6,917	497	601	15	400	41,006

* The residual count was produced using the average provincial percentage of patients receiving treatment outside Canada and the residual count of procedures produced in *Waiting Your Turn*.

Source: Esmail, 2009; calculations by author.

a specialist are not likely to be included in the count shown in table 1. Second, the counts are based on the number of procedures estimated to have been performed in Canada, which is less than the total number of patients consulted and less than the total number of Canadians who would have required treatment, including those who left Canada to seek it.

An estimated count of patients leaving Canada

The products of the percentage of patients receiving non-emergency treatment outside of Canada and the number of patients treated in Canada as estimated in *Waiting Your Turn* are shown in table 1.

A significant number of Canadians—an estimated 41,006 in total—received treatment outside Canada in 2009. There was a notable increase in the overall number of patients receiving treatment outside Canada between 2008 and 2009. Specifically, an estimated 33,492 Canadians were estimated to have received treatment outside Canada in 2008 compared to 41,006 in 2009. Increases in the estimated number of patients going outside Canada for treatment were seen in British Columbia (4,831 to 5,327), Manitoba (449 to 678), Ontario (15,424 to 20,510), Quebec (4,567 to 6,917), and Prince Edward Island (6 to 15). Conversely, Alberta (5,510 to 5,354), Saskatchewan (821 to 707), New Brunswick (669 to 497), Nova Scotia (742 to 601), and Newfoundland and Labrador (473 to 400) all saw decreases in the estimated number of patients treated outside Canada.

This national increase in the estimated number of patients treated outside Canada occurred at the same time as a national decrease in the median wait time for medically necessary treatment. Specifically, the national median wait time for treatment after consultation with a specialist was 8.7 weeks in 2008 and 8.0 weeks in 2009. However, the same is not true among all of the provinces. From 2008 to 2009, wait times fell in British Columbia,

Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, and Prince Edward Island, but rose in Alberta, New Brunswick, and Newfoundland and Labrador.

Conclusion

In 2009, an estimated 41,006 Canadians received non-emergency medical treatment outside Canada. This estimate is a noteworthy figure and is likely to be an underestimate of the actual number of patients who received treatment outside Canada that year. This number represents a significant potential economic loss to Canada. If the provinces were willing to allow private financing of medically necessary care, Canadians likely could have captured the dollars spent by many of the patients who went abroad.

Notes

1 This includes estimates for some provinces that do not provide comparable data to the CIHI.

2 Specifically, the Canadian counts with the temporal mismatch for 2004, 2005, and 2006 were 49,392, 44,022, and 39,282, respectively. Accounting for the mismatch, the counts for 2004 and 2005 were 47,011 and 45,776, respectively (Esmail, 2007).

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Unnatural regulation

It's time to abolish
the Natural Health
Products Directorate

CYNTHIA RAMSAY

Since January 1, 2010, all natural health products for sale in Canada have had to comply with all of the Natural Health Products Regulations (NHPR).

Under the regulations, natural health products (NHPs) are considered a sub-category of drugs and must undergo pre-market evaluation and receive product licenses from the Natural Health Products Directorate (NHPD) to be marketed in Canada. Prior to the regulations, NHPs were considered either a food or a drug, depending on the product, which meant that regulation was either much less onerous (foods) or was based on a previously established model (drugs).

The road to the NHPR began in 1997 when the federal government set up a Standing Committee on Health to conduct a review of the issues surrounding the manufacture, distribution, and use of NHPs. Included in the committee's 53 recommendations was the creation of a new regulatory authority. The NHPD was created in 1999 and the regulations were implemented in 2004. Products that had drug identification numbers when the NHPR came into effect were permitted to maintain them, if so desired, and to be sold for six years before obtaining a NHP product license (Health Canada, 2008). But, by now, they must have a natural product number (NPN) or they will be pulled off the shelves. NHPs previously treated as foods were required to have an NPN by January 1, 2010.

Sales of at least some of these products will stop in 2010 because of regulatory delays, while other products may disappear from the Canadian market altogether.

The NHPD has an enduring backlog. From January 2004 to September 30, 2009, the NHPD received 41,872 product license applications; 30,464 were completed, of which just under 52% (15,790) received licenses, while the others were either refused by NHPD or withdrawn by the applicant (NHPD, 2009b). In the second quarter of 2009, the NHPD was still processing applications from as far back as 2004 (NHPD, 2009b).

Some critics of the NHPD claim that most of the products approved to date have been single-ingredient products (i.e., the easiest to evaluate), and yet only about half of the products submitted to the NHPD have been granted licenses (Buckley, 2008). It is estimated that 60% to 75% of NHPs will ultimately disappear from the market because of the NHPR (Buckley, 2008). Other products will either be withdrawn from, or will never come to, the market because of the cost and time required to go through the regulatory process, which becomes more onerous as the product composition becomes more complicated.

The public safety argument

One of the rationales behind creating the directorate and the regulations was the need to increase the safety of Canadians. In 2004, sales of NHPs amounted to about \$4.3 billion and numbered around 40,000 to 50,000 products (Health Canada, 2004). A 2006 survey on the use of complementary and alternative medicine (CAM) found that more than one-half of Canadians had used at least

Fotolia

It is estimated that 60% to 75% of NHPs will ultimately disappear from the market because of the Natural Health Products Regulations.

one alternative therapy in the year prior to the survey, a four percentage-point increase over the rate of use in 1997 (Esmail, 2007). The size of the industry and the increased use of NHPs in Canada were the main reasons given for broadening the regulatory framework covering these products.

However, there is little evidence to support the public safety argument. Survey data and studies indicate that Canadians are responsible users of NHPs, the vast majority of which are self-care products (i.e., they do not require the buyer to see a health practitioner). For example, more Canadians agreed (46%) than disagreed (24%) that many claims made by the manufacturers of natural health products are unproven, but few agreed (12%) that they were advised against using NHPs or that NHPs were harmful to use (14%) (Ipsos Reid, 2005: 9).

Furthermore, surveys show that unwanted side effects or reactions to NHPs are not common. Only 12% of NHP users surveyed in 2005 reported experiencing unwanted side effects or reactions to NHPs (Ipsos Reid, 2005: 9). In a 2006 survey, the participants who said that they had experienced an adverse drug reaction (ADR) most often experienced it as a result of taking a prescription drug (68%), while 6% said their ADR was the result of taking a nonprescription drug; 4% attributed their ADR to a natural health product and 4% to an interaction between two or more different types of products (Decima Research, 2006: 37).

Worldwide, there are relatively few adverse reactions to NHPs. If the incidence of adverse reactions and death from NHPs in Canada is similar to that in the United States and the United Kingdom, then each year in Canada there are two to six deaths caused by NHPs and 39 to 55 adverse reactions (Ramsay, 2009). By comparison, each year between 9,250 and 23,750 people in Canada experience a preventable adverse event in hospital and later die—more than the number who die from breast cancer, motor vehicle and other transport accidents, and HIV combined (CIHI, 2007). In 2005, more than 2,300 Canadians died from falls, 205 from complications following medical and surgical care, and 122 from exposure to the forces of nature (Statistics Canada, 2005).

Indeed, the NHPR are completely unnecessary as regulations already exist to protect Canadians from unsafe production facilities and bad actors. The Canadian Food and Drug Act prohibits the sale of foods and drugs containing any poisonous or harmful substances or which are adulterated or processed under unsanitary conditions, and it is illegal to advertise any food or drug in a false, misleading, or deceptive manner.

The NHPR are not only tackling a nonexistent safety issue and reducing choice for Canadians seeking NHPs, but they are doing so at a substantial cost. For example, one study that examined just 12 companies found that the new regulations have cost those companies and the Canadian economy more than \$440 million¹ (Stiefel-meyer et al., 2008). This figure includes the employment that would have been created had rejected and not-yet-approved NHPs been permitted to be made or sold here; it does not include the more than \$90 million spent on the NHPD as of fiscal year 2008/2009 (NHPD, 2009a).

Conclusion

The Natural Health Products Regulations were put in place five years ago, but the Natural Health Products Directorate has yet to provide any evidence that the regulations have improved Canadians' access to safe, effective, and high-quality natural health products. Since the cost of regulating NHPs seems to far outweigh the benefits, the Natural Health Products Directorate should be abolished. Once the NHPD is abolished, independent groups could verify the safety and quality of NHPs and their manufacturers, distributors, and other parties in the process. The quality of NHPs would likely be more actively monitored and standards more aggressively maintained because of competition between certifying organizations.

Note

1 This calculation includes "direct costs, opportunity costs to the food manufacturing companies looking to develop new



food products and/or market products with health claims, potential lost sales for retailers because of lack of product availability and potential lost sales for primary producers. Overall opportunity costs to the economy were also examined; these losses include the food manufacturers and all upstream industries' output (lost sales), wages and salaries, foregone taxes, and employment that would have been created due to the economic activity" (Stiefelmeyer et al., 2008: 2).

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The times are a-changin'

Saskatchewan and British Columbia improve their investment climates

CHARLES LAMMAM

The results of the *Canadian Provincial Investment Climate: 2009 Report*, an annual Fraser Institute publication that empirically assesses and ranks Canada's provinces on the attractiveness of their investment climates, can be summed up by an excerpt from Bob Dylan's popular song, "The Times They Are A-Changin'": "The order is rapidly fadin' and the first one now will later be last ... for the times they are a-changin'."

Indeed, this year's report shows that Alberta, traditionally considered to have the best investment climate in Canada, is losing some ground to Saskatchewan and British Columbia, which have recently made improvements to their investment climates.

The Canadian Provincial Investment Climate report looks at areas of public policy that affect business investment (see Palacios et al., 2009). The core of the report is an index composed of seven major areas identified by leading Canadian investment managers as the most important in terms of contributing to provincial investment climates: corporate income tax, fiscal prudence, personal income tax, transportation infrastructure, corporate capital tax, labour market regulation, and overall burden of regulation. The index measures and calculates scores for each area using objective, empirical data (table 1).

As in 2008, the western provinces dominated the overall index's top rankings in 2009. Alberta topped the rankings with a score of 8.5 out of 10.0. Saskatchewan and BC ranked second and third, scoring 6.6 and 6.0 out of 10.0, respectively. Ontario and Quebec—Canada's two most populous provinces—ranked 5th and 8th overall, scoring 4.9 and 3.3 out of 10.0, respectively.

While Alberta is still first, the gap between it and Saskatchewan and BC has narrowed, reflecting an erosion of the so-called "Alberta advantage"—traditionally

understood to be a combination of low taxes and small government. While Alberta has become complacent in recent years, Saskatchewan and BC have actively taken steps to introduce policies that encourage business investment.

For example, Saskatchewan recently improved its investment climate by making its business tax system more competitive.¹ Since 2005, the province has reduced the general corporate income tax rate by almost one-third from 17% to 12%, and has eliminated the corporate capital tax on non-financial institutions.

Similarly, BC has improved incentives for investment through a more competitive business tax system by reducing the corporate income tax rate from 16.5% in 2001 to the current rate of 11%; a further reduction to 10% is planned for 2011, making it equal with Alberta's rate.² BC also eliminated the corporate capital tax on non-financial institutions in 2002 and will remove this tax on financial institutions in 2010. Prior to 2010, Alberta was the only province with no corporate capital tax on either institution, but this distinction will be shared with BC and Ontario as of July 1 this year.

Furthermore, in 2001 BC introduced a historic 25% across-the-board cut to personal income tax rates, which has had and will continue to have a significant impact on economic growth in the province (Dahlby and Ferredé, 2008).³ All personal income tax rates, except the top marginal rate, were reduced by an additional 5% in 2007.

If Alberta wants to retain its advantage, then it would do well to learn a lesson from Ontario, a province that allowed its investment climate to deteriorate through economic complacency and questionable policy choices. Not many years ago, Ontario was rated the best province in Canada for investment, receiving high praise from Canadian investment managers (Clemens, 2002).

**Table 1: Canadian Provincial Investment Climate Index, 2009,
scores and rankings (out of 10), overall and by component**

	Overall		Corporate income tax		Fiscal prudence		Personal income tax		Transportation infrastructure		Corporate capital tax		Labour market regulation		Burden of regulation	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
AB	8.5	1	10.0	1	8.8	1	10.0	1	5.7	7	10.0	1	5.3	1	9.5	2
SK	6.6	2	6.7	4	7.7	2	5.5	3	5.1	9	9.0	2	3.2	4	9.2	3
BC	6.0	3	8.3	2	6.5	4	7.6	2	3.6	10	8.5	3	2.8	6	4.4	6
NL	5.4	4	3.3	7	7.6	3	2.7	9	5.7	7	5.8	6	2.8	6	10.0	1
ON	4.9	5	3.3	7	4.6	6	5.4	4	6.8	2	6.4	5	3.4	2	4.7	5
MB	4.7	6	5.8	5	4.8	5	2.4	10	6.7	3	4.6	8	1.8	9	6.8	4
NB	4.4	7	5.8	5	1.7	9	5.4	4	6.7	3	6.6	4	2.8	6	1.7	9
QC	3.3	8	6.8	3	0.6	10	4.7	6	6.3	5	2.8	9	1.3	10	0.0	10
NS	3.3	8	0.0	9	3.3	7	3.7	8	8.2	1	2.0	10	3.3	3	2.6	7
PE	3.2	10	0.0	9	2.3	8	3.9	7	6.1	6	5.1	7	3.0	5	2.5	8

Source: Palacios et al., 2009.

But since 2003, Canada's most populous province has fallen down the ranks as it has moved away from what made it successful.

For example, Ontario increased its corporate income tax rate from 12.5% to 14.0% shortly after 2003, just as other provinces were making aggressive reductions. Ontario also delayed the planned elimination of its corporate capital tax. The government's decision to increase personal income taxes in 2004 was similarly misguided: while other provinces were making cuts, Ontario cancelled the planned elimination of the surtax on personal income and introduced the Ontario Health Premium.

These policy decisions degraded Ontario's investment climate at a time when the province desperately needed investment to mitigate the effects of a rising Canadian dollar and a declining manufacturing sector.⁴ The increased personal income taxes and capital taxes also discouraged work effort, savings, investment, and entrepreneurship in the province (Palacios and Harischandra, 2008).

While Ontario has suffered greatly from past policy decisions, the Ontario government seems to have realized its errors and is beginning to take remedial action. In fact, Ontario's budget for 2009 constituted a complete U-turn on tax policy (Lammam and Veldhuis, 2009).⁵

Business investment is critical to a jurisdiction's economic success. It provides the resources for businesses to purchase new equipment and machinery, expand existing facilities, and embark on new development ventures. Business investment is essential for improving worker productivity and it ultimately enables people to enjoy higher living standards.

For the Alberta government, the way forward is clear: take heed of Ontario's experience and avoid economic decline by taking steps to improve the province's investment climate while building on existing advantages. Doing so will ensure a prosperous economic future.

Notes

1 See Veldhuis, Palacios, Lammam, and Gainer (2009) for an overview of the improvements to Saskatchewan's tax system.

2 See Veldhuis, Lammam, and Palacios (2009) for a discussion of BC's tax changes and other changes to the province's investment climate since 2001.

3 University of Alberta professor Bev Dahlby, one of Canada's leading economists, and Ergete Ferede recently assessed the economic impacts of the 2001 tax cuts in BC and found that they had a profound impact on economic growth and will continue to do so in the future (Dahlby and Ferede, 2008). Specifically, they found that BC's corporate income tax rate reductions will increase per capita GDP by 18% compared to the level that would have occurred without the tax cuts, and that the personal income tax rate reductions will increase per capita GDP by 7.6% compared to the level that would have prevailed in the absence of the cuts.

4 See Clemens et al. (2005) for a discussion of the poor policy choices made by the Ontario government in the areas of fiscal prudence and labour market regulation.

5 For example, one of the key reforms included in the budget was the harmonization of the provincial sales tax with the federal goods and services tax. Another reform was the gradual

reduction of the general corporate income tax rate from the current rate of 14% to 10% by 2013.

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Spend more, wait less?

Continued from page 17

priority areas, rates of surgery climbed by 7% between 2004–2005 and 2005–2006, and then essentially stopped growing to 2007–2008 (CIHI, 2009b). Importantly, these non-increases occurred at the same time as provincial health spending per Canadian grew by about 9% (after accounting for inflation) between 2004 and 2007 (CIHI, 2009a; calculations by authors).

This preliminary analysis reveals a troubling state of dysfunction in Canada's health care systems. While one might reasonably expect access to health care to improve with increases in funding, there actually appears to be no improvement or possibly even a deterioration in access as funding increases. There is clearly something very wrong with Medicare.

Notes

1 The finding for physicians was statistically significant at the 5% level, while the finding for pharmaceuticals was not.

2 As the structure of Canada's health care systems—first-dollar coverage/no cost sharing, a near public monopoly on funding, and monopolistic public delivery of hospital care—has not changed since Zelder's analysis in 2000, it is reasonable to examine the relationship between spending and waiting for the entire timeframe for which data are available.

3 Readers should note that this is an actual AR(1) process; it is not a lagged variable.

4 The TS coefficient measures the degree to which any increase in spending affects the total wait time. Given a coefficient of 0.002527, we can determine that a \$395.73 increase in spending will result in a one week increase in wait times.

5 While most health care services are funded on a global budget basis, physicians are paid predominantly on a fee-for-service basis in Canada. As a result, increases in physician expenditure can be expected to directly increase the volume of services delivered to some extent.

6 Unlike the 2003 analysis by Esmail, we did not separate the effect of expenditures on drugs from total expenditures on health care as we found drug spending to be highly correlated with physician spending in our dataset.

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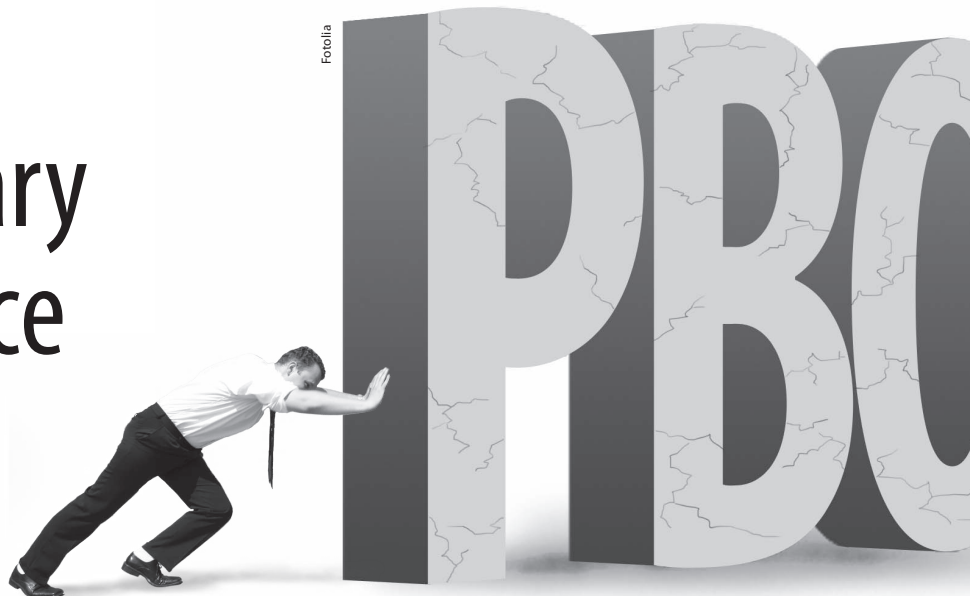
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Scrap the Parliamentary Budget Office

NIELS VELDHIJS AND CHARLES LAMMAM



In November 2009, the Parliamentary Budget Office (PBO) released its update on the federal government's finances, which noted that the federal budget "is not structurally balanced over the medium term" (PBO, 2009: 6). In other words, the PBO believes that the federal deficit is not solely a function of the economic downturn and that the government will remain in deficit once the economy rebounds. To combat this deficit, the government will have to cut spending and/or increase taxes.

Ironically, the day after the PBO released its updated fiscal and economic forecasts, Kevin Page, head of the PBO, warned that his office may have to shut down if it does not receive the \$2.8 million it needs for operations this year (Argitis, 2009, Nov. 3)—a more than 50% increase from last year's budget of \$1.8 million.

The federal government is already facing an estimated \$56 billion deficit for 2009/2010, and further deficits amounting to \$109 billion are expected over the next five years (Canada, Department of Finance, 2009a). In this context, the PBO's funding request provides an interesting case study in how the government should examine its programs

and activities going forward. That is, should the federal government continue to fund the PBO or shut it down?

Back in 1994, then-finance minister Paul Martin was dealing with a relatively more severe (as percentage of the economy) deficit of \$38.5 billion (Canada, Department of Finance, 2009b), and he decided that this deficit would be dealt with by "cutting spending—not raising taxes" (Martin, 1995: 7). To cut spending, the Liberal government initiated a comprehensive review of every government department using a series of "tests." The most important one was whether government involvement was necessary. If the current government used this test on the PBO, the decision would be simple: it's time for the PBO to go.

The PBO was created by the Conservatives in 2006 as part of the accountability reforms implemented following the sponsorship scandal. The PBO's mandate was to provide Parliament with independent analyses of the federal government's finances, trends in the Canadian economy, and the cost of federal proposals.¹

But do we really need another government agency to do much of

the same work as several private sector organizations? What function does the PBO perform that the private sector cannot or does not provide?

Private sector organizations such as TD Economics, Global Insight, Dale Orr Economic Insight, and others regularly produce fiscal projections based on government budgets, many of which are available online for free. In other words, there is healthy competition in the private sector for the production of economic and fiscal forecasts. This competition ensures that no one organization's forecasts dominate, which also serves the purpose of disciplining wildly inaccurate figures.

For instance, in October 2009, TD Economics released its budget forecasts for the next five years and warned that "in order to gradually reduce and then eliminate the federal deficit by 2015-16, total spending growth would need to be constrained to 3% per year on average ... a tall order" (Burleton and Drummond, 2009: 4).

Similarly, Dale Orr Economic Insight warned that "under reasonable economic and fiscal forecasts, under the growing out option, with no significant tax increases or

spending cuts to accelerate deficit elimination, we could not expect the deficit to be eliminated before 2018” (Dale Orr Economic Insight, 2009: 1).

These messages mirror those provided in the PBO’s November update.

However, proponents of the PBO, including several prominent academic economists who recently signed a petition extolling its virtues, argue that the PBO is valuable because it produces independent, detailed, and credible fiscal projections.² But that presupposes that the private sector’s projections are not independent, detailed, or credible.

It is possible that the federal government’s own estimates may be influenced by political motives, but in the early 1990s Paul Martin initiated reforms to eliminate the federal government’s reliance on internal economic forecasts for budgeting purposes (Watson, 2009, July 9). He began by abolishing the finance ministry’s forecasting department. Martin also started a practice that continues to this day: relying on an average of private sector forecasts when preparing budget numbers.

Indeed, these reforms have minimized the government’s ability to fudge budget numbers for political advantage, and they are part of the reason that a recent study published by the International Monetary Fund concluded that “fiscal forecasting in Canada is governed by one of the strongest institutional frameworks relative to benchmark countries,” noting that “One particular strength is the explicit use of macroeconomic projections from a wide range of private forecasters for the preparation of the budget” (Mühleisen et al., 2005: 3).

The practice of using an average of private sector forecasts is also used by the PBO, which regularly surveys the private sector and publishes average forecasts of key economic data in its updates.

In addition to the multitude of private organizations supplying economic forecasts and fiscal projections, some organizations go to great lengths to scrutinize the accuracy of the government’s budget numbers and assess its fiscal policies and programs. These include think tank institutions (including the Fraser Institute), non-profits, lobbyist groups, and professional and academic economists. In a sense, the government already has multiple “watchdogs” helping to keep it honest and disciplined.

Some will say that the PBO is non-partisan and independent, unlike other government organizations that have their own political incentives. But public choice economics shows us that we should not expect the PBO to behave any differently than any other government-financed organization.³ In fact, some observers have accused the PBO of being politically active (Milke, 2009, Nov. 8), which is contrary to its mandate.

But even assuming that the PBO is truly non-partisan and independent, its efforts are of little practical value in the Canadian political context, given the institutional environment. Unlike the United States, where the PBO’s counterpart the Congressional Budget Office (CBO) is more influential, Canada has a parliamentary system. As in many parliamentary systems, the Canadian legislature has limited powers to change a submitted budget (Mühleisen et al., 2005). In general, parliamentarians can only approve or reject the incumbent government’s spending proposal, while the legislatures in the United States are free to change any aspect of a budget proposal. Analysis performed by the CBO is therefore more likely to be used effectively by individual members of Congress to adjust proposals accordingly.

At a time when Canadians are leaving more than \$150 billion in debt to the next generation of

taxpayers, we owe it to them to at least try to be responsible. Before the government grants Page’s request for an increased budget allocation—or such a request from any other government agency for that matter—we ought to ask whether government involvement is necessary. In the case of the PBO, the answer is no.

Notes

1 For more information about the PBO, see PBO (n.d.).

2 For access to this petition and arguments in favour of the PBO, please see Milligan (2009).

3 Please see Clemens et al. (2007) for an overview of public choice theory and several examples of government financed organizations that consistently fail to meet stated objectives.

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Check the numbers

Recent climate scandal underscores the need for academic due diligence

For all the claims of a scientific “consensus,” it is now more evident than ever that proof of a link between human activity and global warming simply does not exist. This was underscored recently when thousands of e-mails from the University of East Anglia Climatic Research Unit in England were posted online by an anonymous whistle-blower. The e-mails contained numerous references to statistical tricks and data manipulations that were used by researchers to support the core tenets of global warming theory.

The e-mail scandal has accelerated a decline in the proportion of people who buy the alarmist theory about global warming. But this is not the first time such deception has been uncovered. Between 2003 and 2005, Stephen McIntyre and Ross McKittrick published a series of papers showing that the infamous “hockey stick” graph, used widely as evidence of human-caused global warming, was based on faulty data and statistical techniques and could not be replicated using the methods described in the original papers.

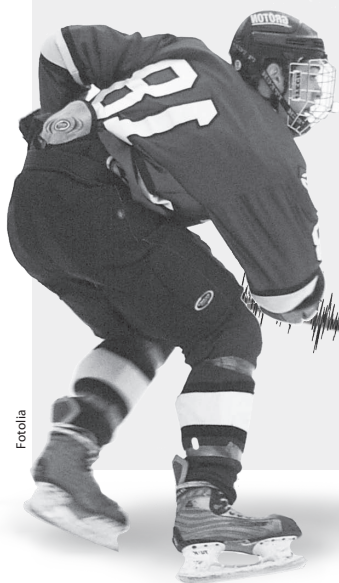
In their attempt to verify some of the key research claims of the global warming alarmists, McIntyre and

McKittrick witnessed a disturbing deterioration in the standards of scientific scholarship and academic due diligence. Their experience is chronicled on the following pages (pp. 30–32) in an excerpt from the 2009 Fraser Institute report *Check the Numbers: The Case for Due Diligence in Policy Formation*.

The study presents other examples of erroneous academic studies that have had very costly consequences for taxpayers. The lessons to be drawn from such incidents are absolutely clear. As McKittrick and *Check the Numbers* co-author B.D. McCullough note, “When a piece of academic research takes on a public role, such as becoming the basis for public policy decisions, practices that obstruct independent replication, such as refusal to disclose data, or the concealment of details about computational methods, prevent the proper functioning of the scientific process and can lead to poor public decision making.”

—Diane Katz, *Director of Risk, Environment, and Energy Policy*





The “hockey stick” graph

B. D. McCULLOUGH AND ROSS MCKITRICK

Excerpted from *Check the Numbers: The Case for Due Diligence in Policy Formation*

The Mann, Bradley, and Hughes (1998; 1999) “hockey stick” graph, shown in figure 1, was a key piece of evidence used by the Intergovernmental Panel on Climate Change in its 2001 *Third Assessment Report* to conclude that humans are causing climate change (Working Group I, IPCC, 2001, ch. 2, fig. 2.7c and ch. 2, fig. 2.20). The graph has a striking visual effect, suggesting the Earth’s climate (represented by the average northern hemisphere temperature) was stable for nine centuries prior to industrialization, then underwent a rapid warming in the 20th century. The hockey stick graph appeared five times in the *Third Assessment Report*, each time in an unusually large and colorful format compared to other data series. It was widely reproduced on government web sites around the world and played an influential role in the debates that took place in many countries between 2001 and 2004 over whether to ratify the Kyoto Protocol.

One of the key selling points of the hockey stick graph (as emphasized in the 2001 IPCC report) was its supposedly robust computational methodology and the high level of statistical significance it supposedly attained in multiple tests. However, in the underlying paper itself (Mann, Bradley, and Hughes, 1998), while mention was made of two tests, called the *R*² and RE statistics, only the RE scores were reported. The RE (Reduction of Error) score is a somewhat obscure test of the fit between a model and its data. Since there are no standard tables for it, significance benchmarks must be computed for each study using a simulation procedure called Monte Carlo analysis.

The data behind the hockey stick was not available on line as of 2003, nor was the methodology clearly

described in the underlying articles. In April 2003, a Toronto businessman named Stephen McIntyre decided to try to replicate the graph, and contacted the lead author (Michael Mann) to ask for the data. Mann initially said that they were not all in one place and it would take a while to gather them up, but eventually he provided a text file containing the data set.

Over the next six months McIntyre and coauthor McKitrick studied the data and implemented the methods described in the original paper, concluding that the original results could not be reproduced. After several attempts to clarify methodological points Mann cut off all further inquiries. After McIntyre and McKitrick published a paper in late 2003 detailing numerous problems in the data and methods (McIntyre and McKitrick, 2003), Mann released a new version of his data set and some hitherto undisclosed details of his methodology. However, the new version of the data set conflicted with the description in the original paper. McIntyre and McKitrick filed a materials complaint with *Nature*, which was reviewed and upheld, leading to an order for Mann to publish a correct data listing. This appeared in July 2004, six years after the original publication. Mann et al. published a *corrigendum* and a new data archive (Mann, Bradley, and Hughes, 2004) but were not required, and indeed refused, to supply either their code or a complete mathematical description of their methods, despite the claim (Mann, Bradley, and Hughes, 1998: 779) that the principal contribution of their study was their “new statistical approach” to analyze global climatic patterns.

The “new statistical approach” turned out to involve a standard method popular among applied statisticians

and available in every statistical software package, called “principal components analysis” (PCA). Mann, however, wrote his own PCA code in Fortran, despite the fact that well-debugged and polished versions of the algorithm were readily available in existing statistical packages. Mann’s PCA code did not give the same answer as SAS, SPSS, or other statistical packages would have.

McIntyre and McKittrick subsequently published two more studies (McIntyre and McKittrick, 2005a; 2005b) diagnosing the main error in Mann’s method. Prior to the PCA step, the proxy data were transformed in such a way as to inflate the weight assigned to proxies with upward slopes in the 20th century.

Figure 2, top panel, shows the first principal component of the largest data network (North American tree rings) as computed using Mann’s method. The strong hockey stick shape drives the final result (figure 1), and its overall influence on the result was said to be justified because, in PCA, the first principal component represents the dominant pattern in the data. The bottom panel of figure 2 shows the first principal component of the same tree ring data set when computed using a correct method, on the centered covariance matrix. Using correct methods, the hockey stick shape falls to the fourth principal component and is only associated with a small but controversial series of tree ring records from the western United States (the “bristlecone pines,” 16 of over 400 proxy series) which prior researchers (as well as the 1995 IPCC report) had warned were invalid for the study of past climate changes.

Figure 1: The hockey stick graph from the IPCC Third Assessment Report

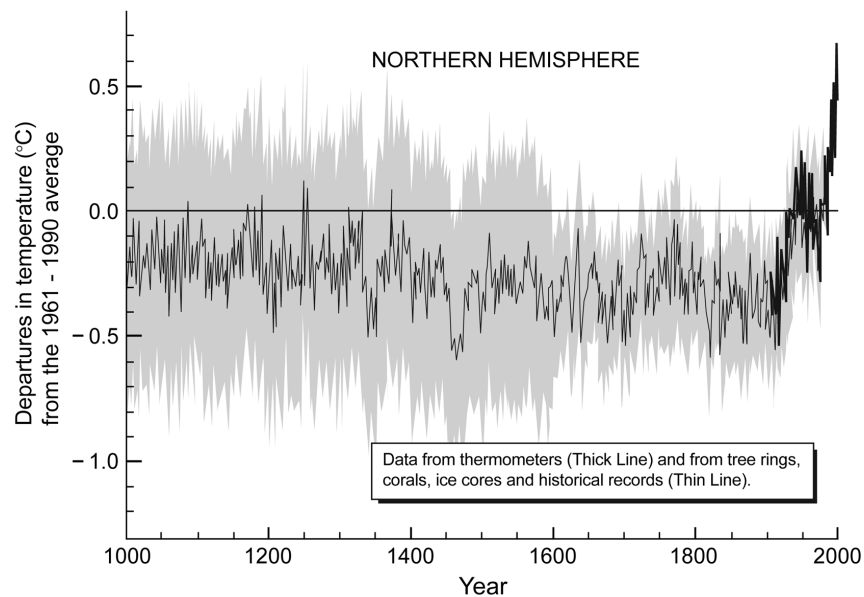
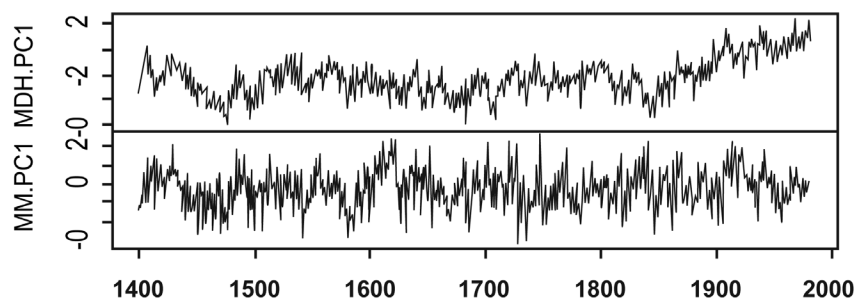


Figure 2

Top: First principal component of North American tree ring network as computed by Mann et al. (1998)

Bottom: same, but computed using standard algorithm



The influence of the faulty PC method was not accounted for in the Monte Carlo algorithm, yielding an incorrect critical value for the RE score. The corrected critical value (McIntyre and McKittrick, 2005a) showed that the reconstruction was invalid for projecting temperatures back 600 years. Also, McIntyre and McKittrick (2005a) reported that the R^2 value confirmed the revised RE score but had not been reported. They also showed that the characteristic hockey stick shape disappeared from the result with the removal of the bristlecone pines

from the data set. And they reported that the exact form of the hockey stick graph could not be replicated, nor could portions of the data set be identified without the code, since they were constructed by splicing segments of PCs together at truncation points that were only disclosed in the code itself. Since Mann refused to release most of his computer code there was no way to sort out the remaining discrepancies.

The US National Science Foundation, which had funded the research, refused a request in 2003 from McIntyre to compel Mann to release his code. Likewise, *Nature* would not compel release of the code, accepting instead a verbal description of the algorithm for the *corrigendum*. In June 2005, the US House Committee on Energy and Commerce intervened to demand Mann release his code. This prompted letters of protest from, among others, the American Meteorological Society, the American Geophysical Union, and the American Association for the Advancement of Science, none of whom had ever objected to Mann's refusal to disclose his data and code in the first place. Mann released an incomplete portion of his code in July 2005, seven years after his paper had been published. Among other things, the code revealed that Mann et al. had calculated the insignificant R^2 statistics, but had failed to report it. Also, files found on Mann's FTP site showed that he had re-run his analysis specifically excluding the bristlecone pine data, which yielded the result that the hockey stick shape disappeared, but this result was also not reported.

In the context of private sector due diligence, a failure to disclose adverse performance is a misrepresentation. It is no less serious in scientific contexts.

In 2005, the House Science Committee asked the National Research Council (NRC) to investigate the controversy over the hockey stick. Prior to beginning its work, the NRC revised its terms of reference to exclude any specific assessment of Mann's work. The Energy and Commerce Committee then asked Edward Wegman, Professor of Statistics at George Mason University and Chairman of the National Academy of Sciences Committee on Theoretical and Applied Statistics, to assemble a separate panel to assess Mann's methods and results. The NRC report ended up critiquing the hockey stick anyway, noting that it failed key statistical significance tests (National Research Council, 2006: 91), relied on invalid bristlecone data for its shape (pp. 50, 106-7), used a PC technique that biased the shape (p. 106), and, like other proxy reconstructions that followed it, systematically underestimated the associated uncertainties (p. 107). The Wegman panel report was published in July 2006 (Wegman et al., 2006). It upheld the findings of McIntyre and McKittrick (p. 4). Among other things, the panel reported that, despite downloading the materials from Mann's web site, they were unable to replicate the hockey stick results (p. 29).

The hockey stick episode illustrates, among other things, the inability or unwillingness of granting agencies, academic societies, and journals to enforce disclosure to a degree sufficient for the purposes of replication. Government intervention in this case resulted in release of essential code. Unless granting agencies and journals deal with this issue forcefully, policy makers should be prepared to accept a responsibility to act if their decisions are going to be based on the findings of unreplicated academic research.

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This excerpt is taken from *Check the Numbers: The Case for Due Diligence in Policy Formation* by B.D. McCullough and Ross McKittrick. The full report is available at www.fraserinstitute.org.