THE FRASER INSTITUTE

2004 Critical Issues Bulletin

How Good is Canadian Health Care? 2004 Report

An International Comparison of Health Care Systems

by Nadeem Esmail and Michael Walker
with Sabrina Yeudall

Critical Issues Bulletins

Critical Issues Bulletins are comprehensive studies of single issues of critical importance for public policy published from time to time by The Fraser Institute (Vancouver, British Columbia, Canada)

The authors have worked independently and opinions expressed by them are, therefore, their own, and do not necessarily reflect the opinions of the members or the trustees of The Fraser Institute.

To order additional copies of Critical Issues Bulletins, any of our other publications, or a catalogue of the Institute's publications, please contact the book sales coordinator:
via our **toll-free order line: 1.800.665.3558, ext. 580**
via telephone: 604.688.0221, ext. 580
via fax: 604.688.8539
via e-mail: sales@fraserinstitute.ca.

For media information, please contact Suzanne Walters, Director of Communications:
via telephone: 604.714.4582
via e-mail: suzannew@fraserinstitute.ca

To learn more about the Institute or to read our publications on line, please visit our web site at www.fraserinstitute.ca.

Date of Issue: April 2004

Printed and bound in Canada

Canadian Publications Mail Sales Product Agreement #0087246

ISSN 1480-3666

Editing and design: Kristin McCahon and Lindsey Thomas Martin

Image for front cover: ©Photodisc, Getty Images, Inc.

The Fraser Institute

The Fraser Institute is an independent Canadian economic and social research and educational organization. It has as its objective the redirection of public attention to the role of competitive markets in providing for the well-being of Canadians. Where markets work, the Institute's interest lies in trying to discover prospects for improvement. Where markets do not work, its interest lies in finding the reasons. Where competitive markets have been replaced by government control, the interest of the Institute lies in documenting objectively the nature of the improvement or deterioration resulting from government intervention. The work of the Institute is assisted by an Editorial Advisory Board of internationally renowned economists. The Fraser Institute is a national, federally chartered, non-profit organization financed by the sale of its publications and the tax-deductible contributions of its members, foundations, and other supporters; it receives no government funding.

For information about membership in The Fraser Institute, please contact the Development Department: The Fraser Institute, Fourth Floor, 1770 Burrard Street, Vancouver, BC, V6J 3G7;
or via telephone: 604.688.0221 ext. 586;
via fax: 604.688.8539;
via e-mail: membership@fraserinstitute.ca.

In Calgary, please contact us
via telephone: 403.216.7175 or, toll-free, 1.866.716.7175
via fax: 403.234.9010
via e-mail: barrym@fraserinstitute.ca.

In Toronto, please contact us
via telephone: 416.363.6575
via fax: 416.934.1639.

How Good Is Canadian Health Care? 2004 Report

An International Comparison of Health Care Systems

Nadeem Esmail and Michael Walker with Sabrina Yeudall

Contents

About the authors and Acknowledgments

Nadeem Esmail

Nadeem Esmail is Senior Health Policy Analyst and Manager of Health Data Systems at The Fraser Institute. He has a B.A. (Honours) in Economics at the University of Calgary and an MA in Economics from the University of British Columbia. He is the co-author of a number of publications on health-care topics, including *How Good is Canadian Health Care?*, a special, full-length edition of *Fraser Forum* (August 2002) and *Waiting Your Turn: Hospital Waiting Lists in Canada, 12th edition*. He is a frequent contributor to *Fraser Forum* and his articles have been published in newspapers across Canada.

Michael Walker

Michael Walker is the Executive Director of The Fraser Institute. As an economist, he has written or edited 50 books on economic topics. His articles on technical economic subjects have appeared in professional journals in Canada, the United States and Europe, including the *Canadian Journal of Economics*, the *American Economic Review*, The *Journal of Finance*, the *Canadian Tax Journal*, *Health Management Quarterly* and *Health Affairs*.

Since 1974, Michael Walker has directed the activities of The Fraser Institute. Before that, he taught at the University of Western Ontario and Carleton University and was employed at the Bank of Canada and the Federal Department of Finance. He received his Ph.D. at the University of Western Ontario and his B.A. at St. Francis Xavier University.

He is a director of a number of firms and other enterprises, including Mancal Corporation and The Milton and Rose D. Friedman Foundation. He is Chairman of The Pacific Academy for Advanced Studies and is on the *Financial Post* Board of Economists. In 1992, he was awarded the Colin M. Brown Freedom Medal and Award by the National Citizens' Coalition and, in 2003, he received an honorary Doctor of Laws degree (LL.D) from The University of Western Ontario.

Sabrina Yeudall

Sabrina Yeudall is a fourth-year student at Simon Fraser University in Burnaby, British Columbia, where she is completing a B.A. in Economics and Latin American Studies. She was awarded fellowships to participate in Leadership for the Americas, a program that enabled students from universities in North, Central, and South America to exchange ideas on public-policy issues. In the program's inaugural year (2000), she presented a paper on Human Capital and Education and she returned the following year as the mentor for the SFU team's Canadian Economic Development project. Ms Yeudall was an intern at The Fraser Institute during spring and summer of 2003 and was co-author of "Lessons from Japan's Health Care System" (*Fraser Forum*, July 2003). She is currently working in the Property Management industry and running a private tutoring and editing service.

Acknowledgments

The authors would like to thank the Max Bell Foundation for funds in support of Sabrina Yeudall during her internship at The Fraser Institute in the summer of 2003.

Executive summary

A new edition

This second edition of *How Good is Canadian Health Care?* provides answers to a series of questions that are important to resolve if Canada is to make the correct choices as it amends its health care policies. The study is strictly comparative and examines a wide number of factors for the member countries of the OECD in arriving at the answers to the questions posed. In this study, we primarily compare Canada to other countries that also have universal access, publicly funded health care systems. Since the United States and Mexico do not, we often ignore these countries in the comparisons made. The study's focus, therefore, is not whether we should "abandon the key elements of Canada's compassionate approach to health care delivery," but how we organize to achieve it. To answer this crucial question, which is also the focus of the current debate about health care reform in Canada, we examine the policies followed in other industrialized, universal-access countries; policies that, at lower cost, produce superior access to, and outcomes from, health care than Canada's policies do.

How much does Canada spend on health care compared to other countries?

It is often said that Canada spends too little on health care. But is it true? In order to answer the question, we first recognize that the average age of a country's population is a big determinant of the amount of money it will have to spend in order to provide adequate health care. In Canada, those aged 65 and over consumed 42.7% of total health care expenditures in 2000/2001 while making up only 12.5% of the population. In order to compare countries, we adjust the data for the age of the population and discover that Canada spends more on health care than any other industrialized OECD country except Iceland (ExSum Figure 1).

Which countries other than Canada shun user fees and other forms of cost sharing?

An important consideration in the use of health care resources is the cost of access at the point of consumption. The evidence surveyed in this study suggests that health care costs can be significantly reduced if consumers of care have to participate in paying for the care they demand. While bearing in mind that low-income citizens may be exempted from paying user fees, the question is, do other universal-access countries share Canada's notion that user charges should be banned? In fact, most do not. More than three quarters of the universal-access countries in the OECD also charge user fees for access to hospitals, general practitioners, or specialists—and in many cases, to all three. In banning user fees, Canada is very much in the minority.

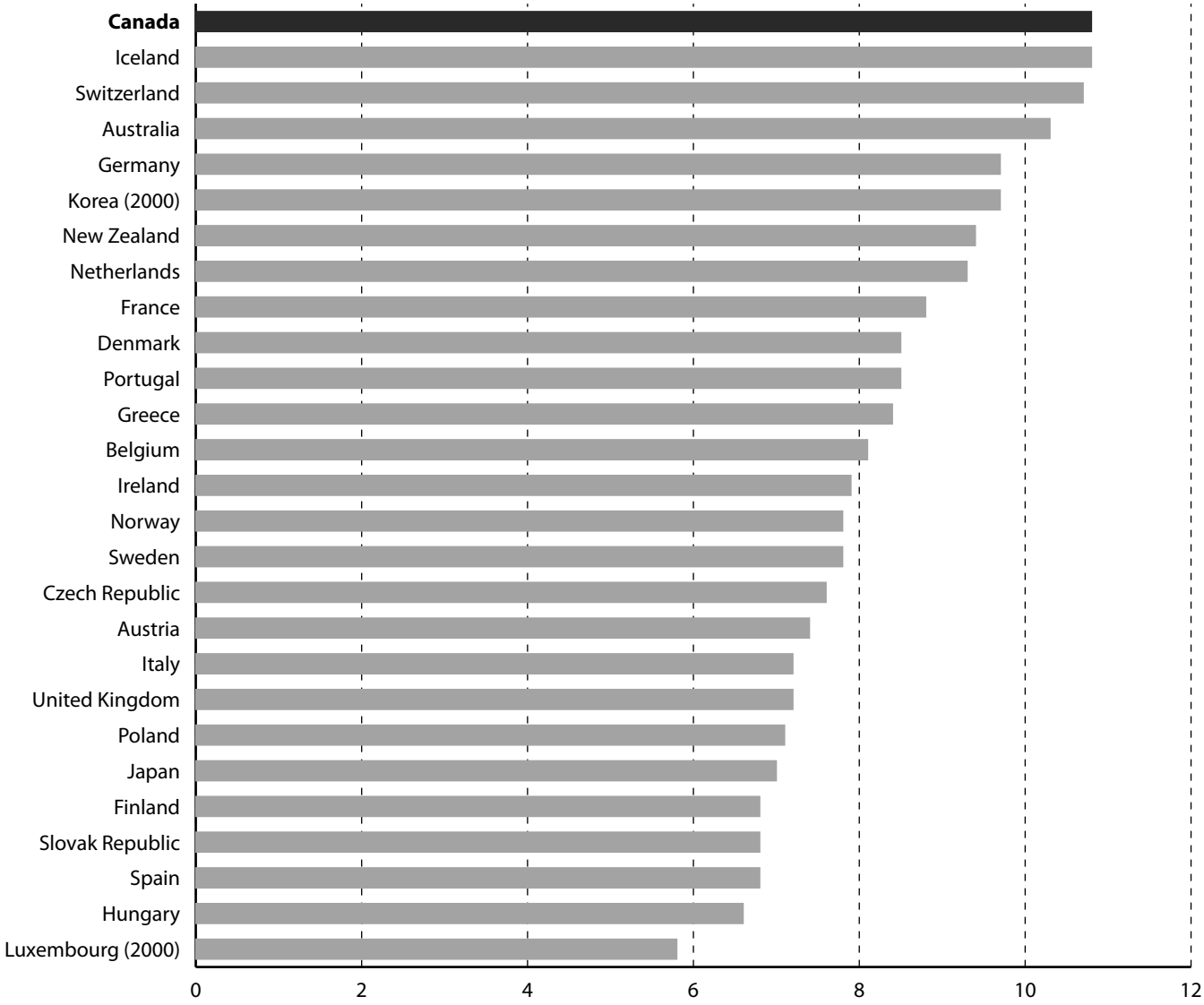
Do other countries follow Canada's model of monopolistic public provision of health insurance?

No, Canada is the only country in the OECD that outlaws privately funded purchases of core services. Every other OECD country has some form of user-pay, private provision of health care. Also, while many OECD countries require that only public hospitals provide publicly insured services, it is also the case that more than half of the countries permit private providers to deliver publicly funded care.

Does Canada have too many doctors, and should it put the doctors it has on salary?

On an age-adjusted, comparative basis, Canada, relative to comparable countries of the OECD, has a small number of physicians: it ranks sixteenth out of 23 countries with 2.3 doctors per 1,000 people for a total of 65,226 doctors (ExSum Figure 2). To rank as highly as first-ranked Aus-

ExSum Figure 1: Age-adjusted health spending (% GDP) in OECD countries with universal access, 2001



Source: OECD 2003; calculations by authors.

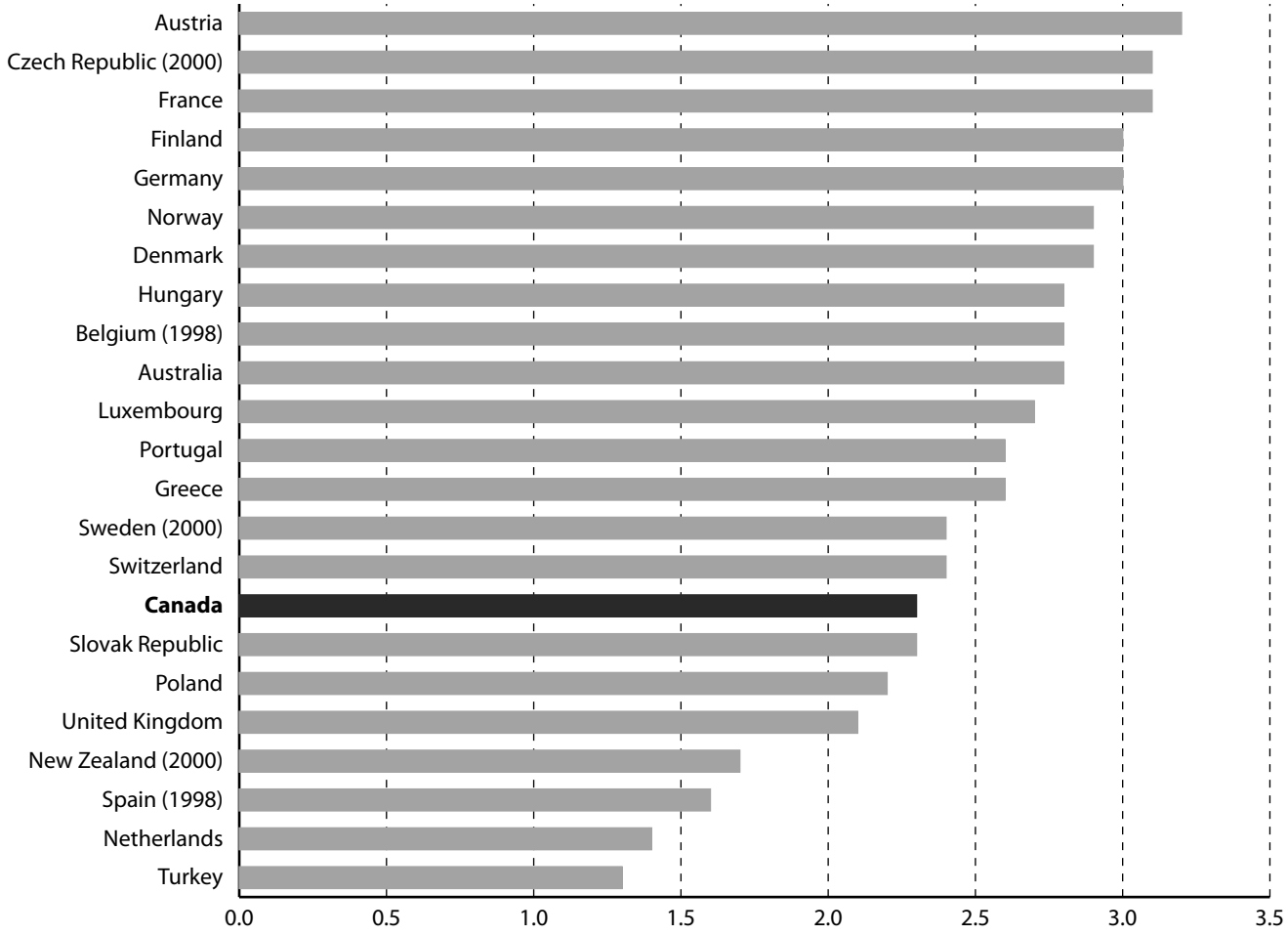
tria, for example, Canada would have to have had 25,500 doctors more than we actually did in 2001. In 1970, the year when public insurance first fully applied to physician services, Canada ranked second of the countries that could be ranked in that year. Whether we have too many or too few doctors in an absolute sense is an impossible question to answer but we have many fewer doctors per capita on an age-adjusted basis than most other countries in the OECD, and report longer waits for access to treatment.

A recent survey by Harvard University for the Commonwealth Fund punctuates the problems of access to care in Canada. In the survey, Canadian respondents were more likely than any other universal-access country surveyed to wait more than one month for non-emergency surgery, though there was only a small difference between Canada and the United Kingdom. Canadians were also most likely to find it somewhat, very, or extremely difficult to see a specialist (Blendon et. al., 2002).

The same survey found that access to care was not uniform among socioeconomic groups in Canada. Those with incomes below average were 9% less likely than those with incomes above average to rate care as excellent and 6% more likely to rate care as poor. These Canadians were also more likely to have difficulties seeing a specialist.

Canadian doctors are paid generally on a fee-per-service basis and, in this particular area of policy, Canada is aligned with the majority of OECD countries. Only 33% of the countries in the OECD rely in part or in whole on salary compensation for general practitioners. And only 7% of the countries rely exclusively on salary compensation. For specialists, 69% of OECD countries rely in part or wholly on salary compensation, while 35% rely on it exclusively.

ExSum Figure 2: Doctors per 1,000 population (age-adjusted) in the OECD, 2001



Source: OECD 2003; calculations by authors.

Do other countries follow Canada's model of funding health care primarily from general tax revenues?

Regrettably, international comparison does not enable us to choose between the greater transparency of a segregated social insurance program or general taxation funding since half of the OECD countries use general taxation and half use segregated taxation or a social insurance program.

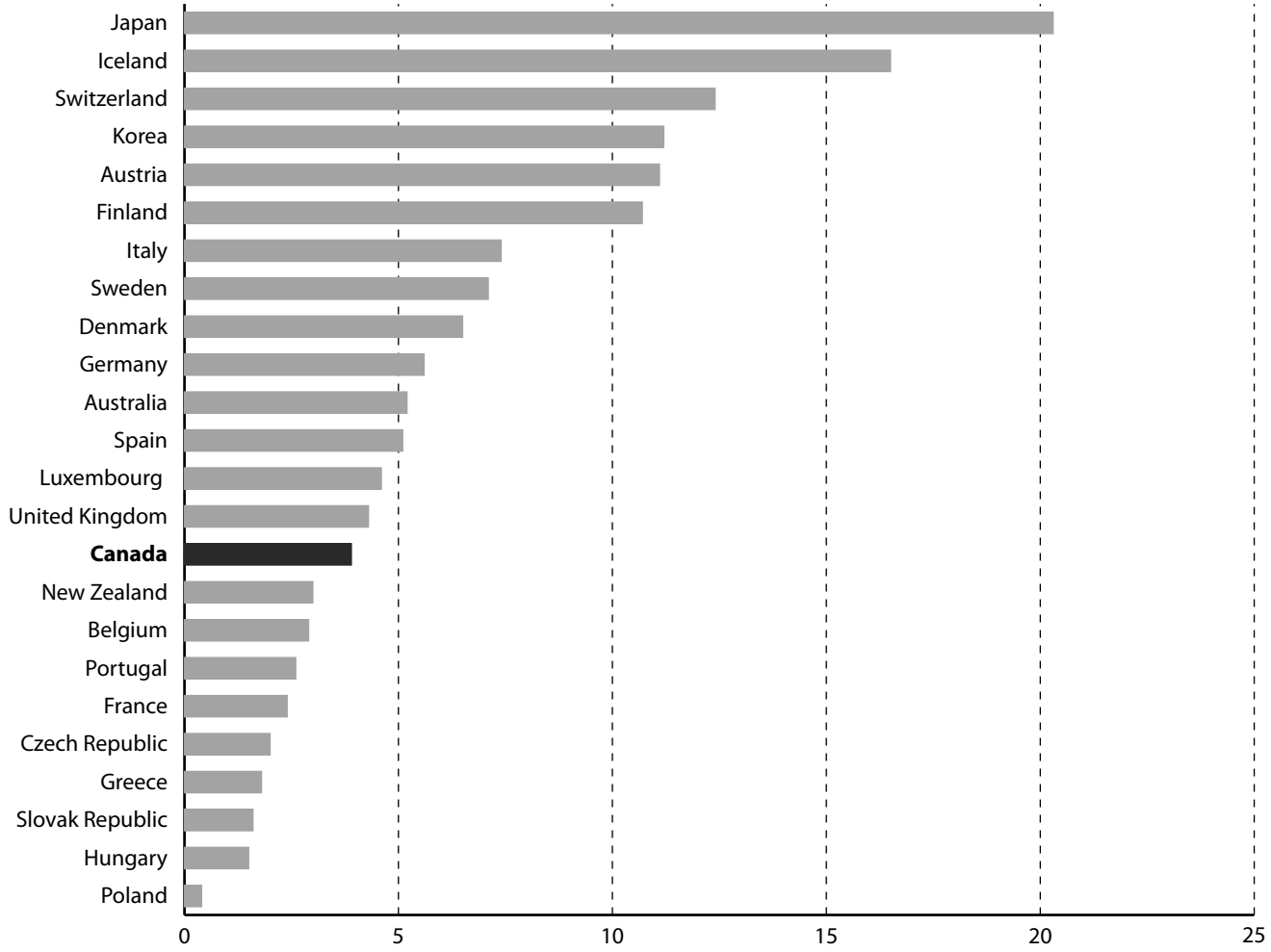
Canada spends more on health care than any other universal access, industrialized country. Canada is also unique in banning private medicine. Do we get our money's worth and are we well served by our government-centered health care system?

While it is easy to calculate the comparative costs of health care amongst the OECD nations, it is more difficult to know whether we receive value for money expended. In this study, 12 indicators of access to health care and outcomes from the health care process are examined. One relates to access to physicians, four relate to access to high technology equipment, and seven relate to health outcomes.

With regard to age-adjusted access to high-tech machinery, Canada performs dismally by comparison with other OECD countries. While ranking number one as a health care spender, Canada ranks fifteenth of 24 in access to MRIs (ExSum Figure 3), seventeenth of 23 in access to CT scanners (ExSum Figure 4), eighth of 22 in access to radiation machines, and is tied for last in access to lithotriptors. Lack of access to machines has also meant longer waiting times for diagnostic assessment, and mirrors the longer waiting times for access to specialists and to treatment found in the comparative studies examined for this study.

One of the great problems for the worldwide debates about health care is the dearth of measurement of health care outcomes that could be used to determine the effectiveness of health care systems. However, a number of comparative rankings are available that are suggestive of

ExSum Figure 3: MRI machines per million population (age-adjusted) in the OECD, 2001

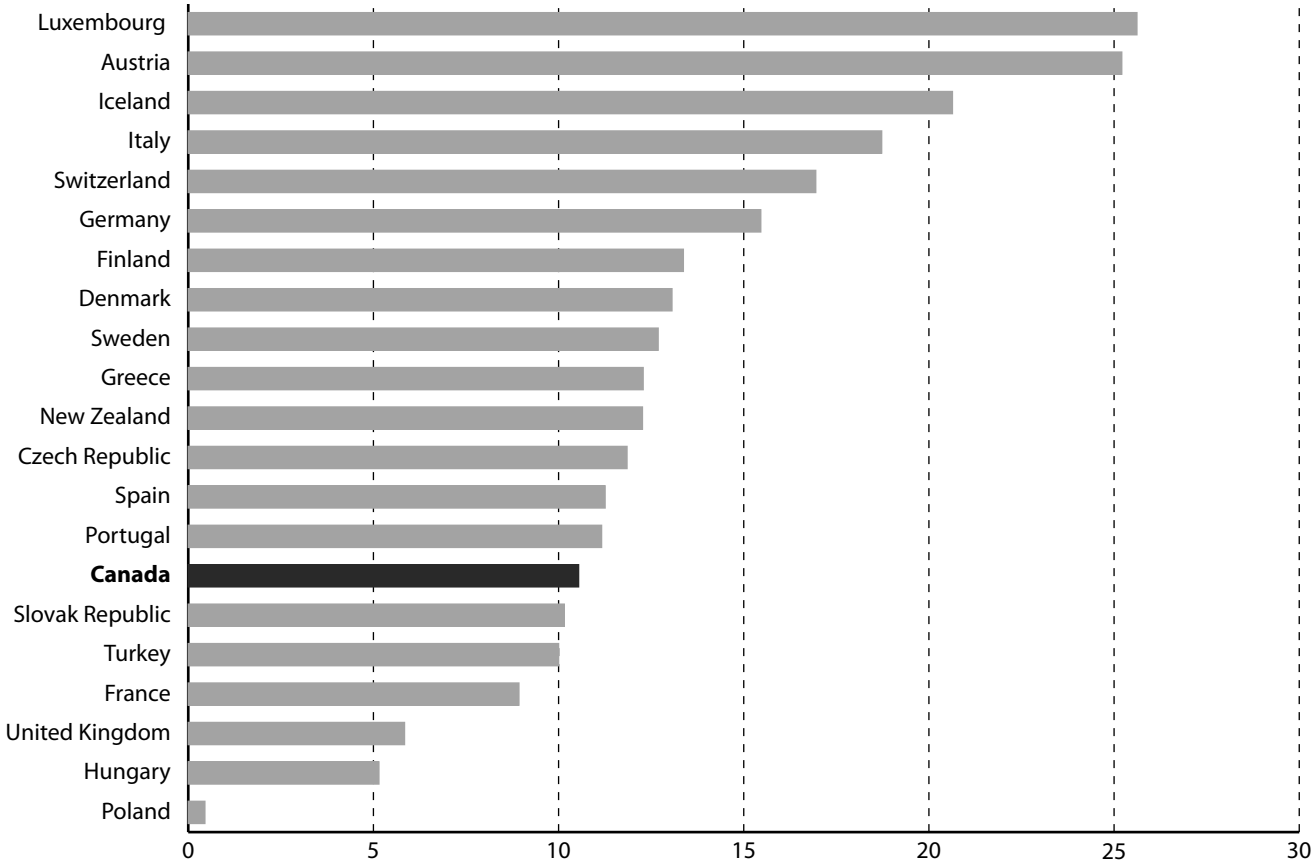


Source: OECD 2003; calculations by authors.

the ability of the health care system to deal with disease. In this study, seven outcome measures have been employed to rank the performance of the OECD countries: disability-free life expectancy versus total life expectancy; infant and perinatal mortality; mortality amenable to health care; potential years of life lost to disease; and the death rates from breast cancer and colorectal cancer (ExSum Table 1). The study finds that Canada, while spending more on health care than any other industrialized country in the OECD, ranks fourteenth in the percentage of total life expectancy that will be lived disability free, ranks sixteenth in infant mortality and twelfth in perinatal mortality, ranks eighth in mortality amenable to health care, ranks ninth in potential years of life lost to disease, and ranks sixth in the incidence of breast cancer mortality. Only in one comparison of health outcomes, the incidence of mortality from colorectal cancer, does Canada manage a first-placed performance that is commensurate with its ranking in the expenditures comparison.

Most notable about this international comparison of outcomes is that all of the countries that have fewer years of life lost to disease and that have lower mortality amenable to health care than Canada also have private alternatives to the public health care system, and only one in the latter comparison does not have some form of user fees at the point of access. Furthermore, not one of these countries spends more on health care than Canada after age adjustment. All of the countries that produce a longer proportion of disability-free life expectancy for their populations have a private care sector competing for patient demand; over three quarters of them also have some form of cost sharing for access to the system. Looking at a specific, treatable, catastrophic disease such as breast cancer, Canada ranks sixth. All of the comprehensive, universal-access countries that do better than Canada in preventing mortality from breast cancer have private health care alternatives, have some form of user fees at the point of access, and spend less of their countries' GDP on health care.

ExSum Figure 4: CT scanners per million population (age-adjusted) in the OECD, 2001



* Figure does not include Japan or Korea as both have a much higher number of CT scanners (73.7 and 44.8 per million population respectively) than other countries.

Source: OECD 2003; calculations by authors.

Conclusion

The comparative evidence is that the Canadian health care model is inferior to others that are in place in the OECD. It produces inferior age-adjusted access to physicians and technology, produces longer waiting times, is less successful in preventing deaths from preventable causes, and costs more than any of the other systems that have comparable objectives. The models that produce superior results and cost less than Canada's monopoly-insurer, monopoly-provider system have: user fees; alternative, comprehensive, private insurance; and private hospitals that compete for patient demand. The overwhelming evidence is that, in comparative terms, Canada's system of health care delivery under-performs, and needs to emulate the more successful models available elsewhere in those countries that offer their citizens universal access to health care.

ExSum Table 1: Performance of Health Systems in OECD Countries

	Mortality Based on Population Statistics			Mortality Closely Related to the Effectiveness of Health Care				
	Disability Free Life Expectancy / Life Expectancy Rank 1999	Infant Mortality Rank 2001	Perinatal Mortality Rank 2001	Mortality Amenable to Health Care Rank 1998	Potential Years of Life Lost Rank 1999	Breast Cancer Mortality Rank 2000	Colorectal Cancer Combined Mortality Rank 2000	Cumulative Rank
Sweden	9	4	7	2	1	1	4	1
Japan	5	2	1	3	3	4	3	2
Australia	2	16	9	7	7	3	2	3
France	1	10	17	1	11	5	5	4
Canada	**14**	**16**	**12**	**8**	**9**	**6**	**1**	**5**
Luxembourg	13	22	21	—	6	15	12	6
Finland	14	3	2	15	8	2	10	7
Italy	8	8	9	6	10	10	9	7
Norway	11	5	11	5	5	7	20	9
Netherlands	6	16	22	11	13	8	6	10
Switzerland	18	12	16	—	4	20	16	11
Belgium	7	14	19	—	18	12	12	12
Iceland	24	1	4	—	2	28	15	13
New Zealand	25	20	13	14	15	9	8	14
Germany	21	9	13	9	14	13	14	15
Korea	26	24	5	—	22	11	23	16
Greece	—	22	25	12	17	18	11	17
Portugal	11	14	6	17	24	14	7	18
Spain	3	6	7	4	16	24	18	18
Austria	10	11	13	13	12	17	21	20
Poland	14	26	23	—	25	22	22	21
Czech Republic	20	7	2	—	23	25	24	22
Denmark	21	12	—	10	19	16	27	22
Ireland	18	20	24	16	21	21	17	24
Hungary	23	27	26	—	27	23	26	25
United Kingdom	3	19	17	18	20	19	19	25
Slovak Republic	14	24	20	—	26	26	25	27
Turkey	—	28	—	—	—	27	28	—

Sources: WHO, 2000; OECD, 2003; Ferlay et al., 2001; Nolte and McKee, 2003.

Introduction: How good is Canadian health care?

Every government in the OECD provides some manner of health insurance for its populace. In some cases, comprehensive health care coverage is provided by a government-run insurance scheme on a universal basis; in others, it is provided by government only for specifically identified population groups while the bulk of the population obtains coverage through a purely voluntary private insurance system. In between these two extremes fall various types of mixed insurance systems, including those where comprehensive private insurance is mandatory and those where private insurance is designed to cover only the care not funded by the public system. Some systems even allow consumers to choose between comprehensive private and public health insurance.

Each of these approaches to health insurance is built around a set of policies that determines how health services will be financed, how physicians and hospitals will be paid, what responsibilities patients will have for payment of services, and whether or not patients can opt to finance all of their care privately. Ultimately, the types of policies that governments choose will affect the quantity and quality of care that is provided to their populations. Health policy choices must therefore be assessed on the basis of value for money—in other words, how good is the health system at making sick and injured people better, at making health services available, and at what economic cost? In order to answer these questions, *How Good is Canadian Health Care?* examines the way that health services are delivered in other nations, whether these policy choices differ from those in Canada and what the optimal policy choice is, based on various measures of access and health outcomes.

Why does government intervene?

Insurance initially developed as a market response to minimizing the impact on individuals of a catastrophic event. The genius of insurance is to share collectively the financial risk of a catastrophic expense occurring that could not easily be afforded by individuals. Suppose the residents of a neighbourhood of ten households expect that one of the houses in the neighbourhood will burn down. However, they do not know which one. It costs less for all households to pool some money to pay to rebuild the one house that burns down than for each household to save enough money to replace its house if it burns down, given that there is only a 10% chance of this occurring for each household.

Governments intervene heavily in health care insurance markets in every developed country. There are two main, theoretical, reasons for government intervention in the health care: adverse selection and distributive justice.

Adverse selection

Adverse selection is the negative economic consequence that can result from an information asymmetry, where purchasers of insurance (those buying into the pool) know their own likelihood of needing the insurance and the insurance providers (the managers of the pool) do not. In the case of medical insurance, people in poor health or those who have a family history of severe illness have an incentive to hide their higher risk from the insurance pool, so as to avoid paying the higher insurance premiums that would be required to cover that risk adequately. At the same time, insurers will want to charge the ill more for an insurance policy than they will the healthy, because the cost of providing them insurance is higher (insurance policies are priced according to the likelihood and cost of illness plus an administration charge). If the insurers are unable to differentiate between high-risk and low-risk individuals, they cannot offer a fair insurance policy to either group: the healthy will not purchase an insurance package priced for the ill and the insurance company will lose money if it sells a package priced for the healthy to the ill (Pauly, 1974). Further, if the insurance company offers any policy in between the "fair" rates for the ill and the healthy, the healthy are likely to leave the insurance pool, thus raising the average

risk level of the pool and forcing premium prices upward. This "death spiral" of adverse selection, wherein risky people seek insurance from insurers who do not want to insure them and healthy people avoid insurance from insurers who want to insure them, can theoretically cause private markets in health insurance to fail (Evans, 1984; Folland et al., 2001).

When government intervention forces the entire population to purchase insurance, all risks are pooled—high-risk individuals are pooled with low-risk individuals—such that all individuals pay an insurance premium based on the average risk level of the pool. In this way, the problem of adverse selection is overcome by preventing low-risk individuals from leaving the insurance pool and allowing high-risk individuals into the pool at a lower rate than would be necessary to insure them otherwise. In Canadian health policy, this justification for government intervention is distorted into the view that government should be the sole provider of health insurance.

But, is this community pooling of risk necessary to overcome adverse selection? Though the empirical research on adverse selection is limited, Cawley and Philipson (1999) have found that, at least in the life insurance market, adverse selection may not actually occur in the modern marketplace. Noting that a private insurance market can exist in the presence of adverse selection if an insurer charges higher unit prices for increasing quantities of insurance (the opposite of bulk discounting), the authors find that unit prices for life insurance actually fall once readily apparent risk characteristics (age, sex, smoker or non-smoker, measured health status, income, and wealth) are accounted for. Further, they find (accounting for a number of factors) that low-risk individuals actually purchase more insurance than high-risk individuals (Cawley and Philipson, 1999). This result casts serious doubt on the claim that a government insurance program is necessary to overcome information asymmetry problems (Zelder, 2000d).

Distributive justice

Distributive justice, the second justification for government intervention, is the idea that all residents of a country should receive health services based on their needs rather than their ability to pay (Flood, 2000). In Canada, this has also come to mean that the wealthy should not benefit from their wealth in obtaining health services (Selick, 1995; Boucher and Palda, 1996). However, government intervention is not necessarily the ideal approach to caring for those who cannot pay for their own health care or buy insurance. The voluntary charitable sector has historically been shown to be efficient and effective at caring for those who cannot afford to care for themselves (Boaz, 1999; Beito, 2001). In fact, there is no obvious reason to suppose that a government monopoly will be the most efficient provider of health insurance or producer of health services for the poor. After all, the government does not produce the food, shelter, and clothing that also are provided to welfare recipients.

The Canadian health care system

Concern about adverse selection and distributive justice have justified the creation of a universal health care system in Canada, which requires that all individuals pay for medically necessary health services for the entire resident population through their taxes. Originally modeled on the United Kingdom's National Health Service (Law and Mihlar, 1996), the Canadian system has been subject to a number of internal reforms and reorganization in various provinces during the last two decades, although these reforms have not addressed the questions posed in this paper. Alberta and British Columbia may be notable exceptions, as both provinces have begun to tap the private sector's potential for delivery of health services.

The Canadian system is a system funded from government revenues that provides first-dollar coverage (i.e., no user fees or cost sharing) for medically necessary health services (as defined by provincial governments) for legal residents. This system has some advantages over a system like that found in the United States, where health insurance contributions are employer-based and coverage is not very portable after loss of a job or a career change and where individuals may find themselves uninsured against medical catastrophe despite large government health plans there. There are also great disadvantages to the Canadian system, such as a lack of responsiveness to changes in demand, a lack of user-determined investment as the system is governed largely by the political process, and a lack of choice for patients searching for the best provider.

The Canadian system is designed around the Canada Health Act and its five fundamental tenets: public administration, comprehensiveness, universality, portability, and accessibility. The Canada Health Act provides a short explanation of each tenet so that provinces can design a health system that will preserve their access to federal funding.

- The rule of public administration states that the administration of the health care insurance plan of a province or territory must be carried out on a non-profit basis by a public authority.

- The rule of comprehensiveness states that all medically necessary services provided by hospitals and doctors must be insured.
- The rule of universality states that all insured persons in the province or territory must be entitled to public health insurance coverage on uniform terms and conditions.
- The rule of portability states that coverage for insured services must be maintained when an insured person moves or travels within Canada or travels outside the country.
- The rule of accessibility states that reasonable access by insured persons to medically necessary hospital and physician services must be unimpeded by financial or other barriers.

In addition to these rules, two provisions in the Canada Health Act cover cost sharing. The first stipulates that there cannot be extra billing for medical services by doctors working under the terms of the health insurance plan of the province or territory. The second states that there will be no user charges for insured health services by hospitals or other providers under the provincial or territorial health care plan.

These rules serve as guidelines for provincial health planners who decide what the health care system in each province will provide and how it will be provided.

Consequences of the Canadian system

This system of health care provision, from which appropriate incentives have all but vanished and innovative thinking has been eliminated by the constrictive rules laid out in the Canada Health Act, has resulted in the progressive rationing of health care. Although rationing in tax-funded health care systems is not uncommon, the increasing rationing in Canada has resulted in waiting times for health services that are both historically and internationally high (Esmail and Walker, 2003). The median waiting time in Canada in 2003 was 17.7 weeks from a general practitioner's referral to treatment by a specialist (Esmail and Walker, 2003). The waiting times for access to diagnosis using expensive medical technologies are also remarkably long. In 2003, patients were forced to wait over one month for CT scans, almost three months for an MRI, and more than three weeks for an ultrasound (Esmail and Walker, 2003).

Any system of health care provision, even those funded directly by patients, can expect waiting due to medical reasons, personal scheduling issues, and general micro-fluctuations in supply (doctors' vacations and seasonal fluctuations in demand, for example). However, the waiting times experienced in Canada are well beyond these normal levels and are getting longer each year.

This second edition of *How Good is Canadian Health Care?* addresses these fundamental issues by comparing Canadian health policy, health access, and health outcomes to those in the rest of the industrialized world (the OECD[1]). Each of these areas and, where necessary, the economic theory underlying them will be considered in the following pages

One key point in the examination of health care systems is that the concern about distributive justice that motivates government involvement in health care is not unique to Canada. Most other OECD countries' health insurance schemes are financed according to an individual's ability to pay while health care is provided according to need (Wagstaff et al., 1992). Thus, the practical question is not whether we shall abandon the key elements of Canada's compassionate approach to health care delivery but how we organize to achieve it. As a consequence, in this study we primarily compare Canada to other countries that also have universal-access, publicly funded, health care systems. Because the United States and Mexico do not, they are not included in the comparisons presented below.

How much does Canada spend on health care compared to other countries?

Two independent analyses of spending and health service provision in Canada (Zelder, 2000a; Esmail, 2003) have found no connection between health expenditures and access to health services in Canada. This invites an examination of how much Canada spends on health care compared to other developed countries as the first step in understanding why increases in Canadian health spending fail to improve patients' welfare.

Health care spending in Canada for 2003 was forecast to be $121.4 billion or more than $3,800 per person (CIHI, 2003). This total spending for 2003 is approximately 10% of that year's GDP (CIHI, 2003). Comparing this last number internationally controls for the level of income in a given country and shows what share of total production is committed to health care expenditures. By doing so, we avoid flawed comparisons with low spending in less developed OECD countries, such as Poland and the Czech Republic, while also not overvaluing high expenditures in relatively rich countries, such as Canada and Germany.

The most recent international data, from 2001, show that Canada is the third highest spender on health care among universal-access countries in the OECD (figure 1). Both Switzerland and Germany devoted a higher share of their GDP to health care than did Canada. The remaining 25 countries in figure 1 spent less. In 2001, Canada's spending as a share of GDP was 9.7%, compared to an OECD average of 8.0%.

Unfortunately, this comparison of health spending is overly simplistic, as it does not account for the effects of populations of different ages. The need to make such an adjustment can be easily demonstrated by noting the proportion of health spending on those aged 65 and over. In Canada, seniors (those aged 65 and over) accounted for 12.5% of the population in fiscal year 2000/2001, yet consumed 42.7% of total health expenditures that year (Grenon, 2001). Further, per-capita health expenditures for those over age 85 were approximately nine times higher than the average spending for all age groups in Canada (Grenon, 2001). Data from the OECD confirms that health expenditures on seniors are significantly higher than per-capita spending in general (OECD, 2001). A simple comparison of spending, such as the one given above, will result in an underestimation of spending for younger populations. This is precisely the case in Canada, which has the eighth lowest proportion of seniors of the 27 OECD countries compared below (table 1).[2]

Adjusting for age structure of a country's population is complex. Principally, the adjustment requires a great deal of data on health expenditures by population age group, which is not readily available for all countries. However, by taking note of the information on Canada and the demographics in the OECD, it is possible to construct estimates of health expenditures based on estimates of expenditure change resulting from changes in age profiles.

A basic estimation, described in box 1, relies on the assumption that health expenditures increase by an amount equal to the proportional change in the seniors' proportion of the population. This admittedly high adjustment for population spending increases is given in the second column of table 2. All countries in this table have had their ratios of those aged 65 and over normalized to 14.6%,

Box 1: A Basic Age Adjustment Calculation

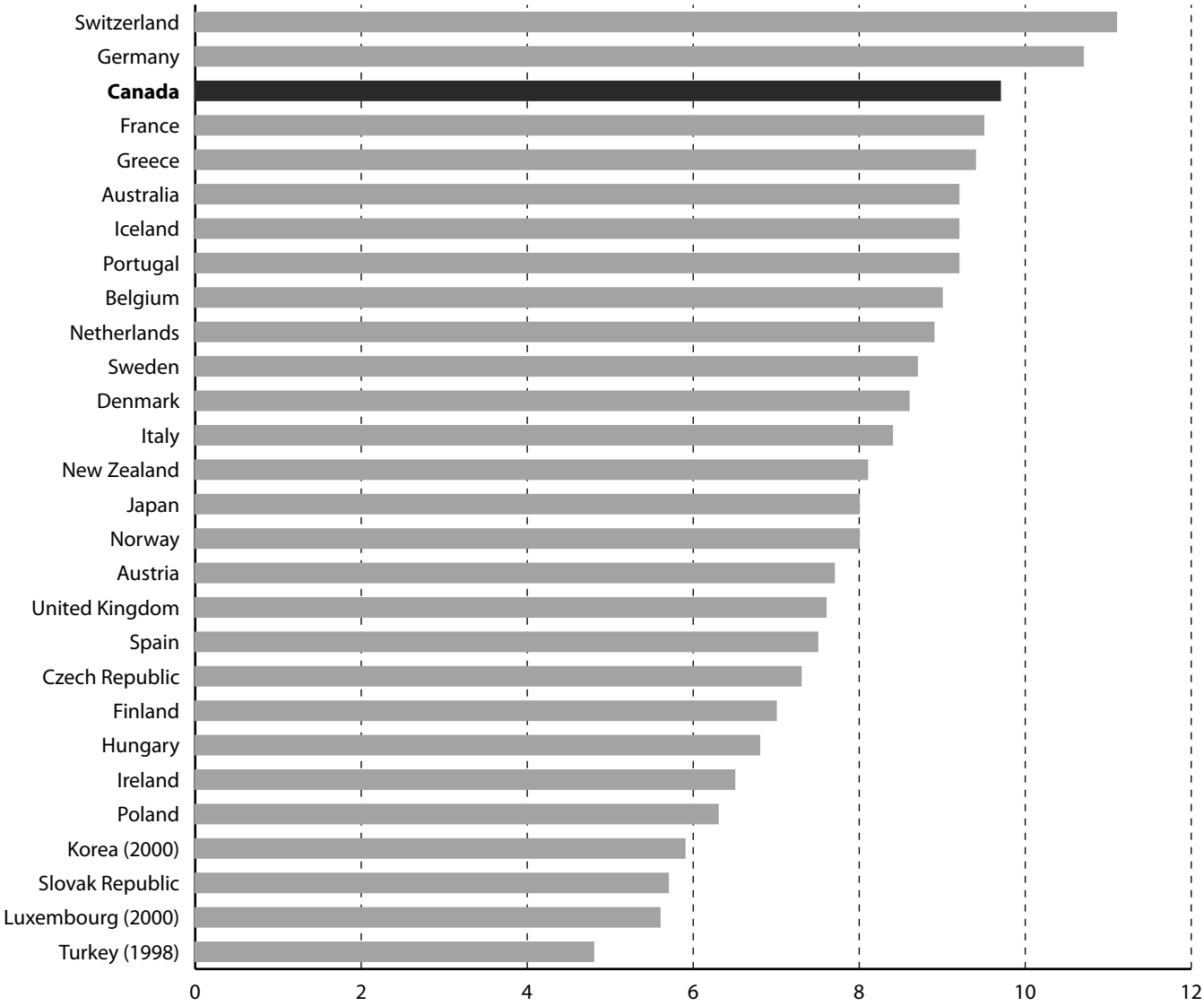
Case 1 is estimated based on the following formula:

1. (Senior's Proportion of Population, Base Country) = β_B
2. (Senior's Proportion of Population, Estimated Country) = β_E
3. $\beta_B / \beta_E = \gamma$
4. (Health Expenditure [%GDP] Estimated Country) = π
5. $\gamma * \pi$ = Adjusted Health Expenditure

Canada as an example:

1. $\gamma = \beta_B / \beta_E = 14.6 / 12.6 = 1.159$ (158.7%)
2. $\gamma * \pi = (1.159) * (9.7) = 11.2$

Figure 1: Unadjusted total expenditure (% GDP) on health, 2001



Source: OECD 2003; calculations by authors.

the average proportion of the population over the age of 65 in these 27 countries. With this adjustment, Canada's spending in 2001 would have been 11.2% of GDP and Canadian health spending as a share of GDP would have ranked third, behind only Iceland and Korea. This adjusted spending level reflects what the Canadian health care system would cost if the proportion of the population over the age of 65 in Canada equaled the average of these 27 countries.

Admittedly, this examination is overly simplistic. A more rigorous adjustment uses data on spending in Canada and extrapolates the proportional increase in total expenditure that occurred simultaneously with an aging of the population. This more rigorous method is then used to estimate what health spending would have been in 2001 after adjusting for population demographics.

Data for this estimation is readily available for Canada for the years 1980/1981 to 2000/2001 (Grenon, 2001). This data can be used to ascertain the approximate increase in health expenditures that would result from an increase in the senior population. Box 2 gives the calculations for this estimate and the next. Between 1980/1981 and 2000/2001, the senior share of the population increased 33.0% while their share of total spending increased 22% (Grenon, 2001). Thus, the increase in health expenditure as a result of an aging population is a 67% increase for every 100% increase in the senior share of population.

Unfortunately, this estimate is not without its flaws either. The 67% adjustment factor is coming from an increased share of estimated health expenditure and not a true growth in health expenditure adjustment. Health expenditure data

Table 1: Population Age Structure in the OECD in 2001

	Percent of Population over Age 65	Rank
Korea	7.6%	1
Ireland	11.2%	2
Slovak Republic	11.4%	3
Iceland	11.6%	4
New Zealand	11.9%	5
Poland	12.4%	6
Australia	12.5%	7
Canada	**12.6%**	**8**
Netherlands	13.6%	9
Czech Republic	13.8%	10
Luxembourg	14.0%	11
Denmark	14.8%	12
Norway	15.0%	13
Finland	15.1%	14
Hungary	15.2%	15
Switzerland	15.4%	16
Austria	15.5%	17
United Kingdom	15.9%	18
France	16.2%	19
Portugal	16.4%	20
Belgium	16.9%	21
Germany	16.9%	21
Spain	17.0%	23
Sweden	17.2%	24
Greece (2000)	17.3%	25
Japan	17.8%	26
Italy	18.4%	27
OECD Average	14.6%	

Source: OECD, 2003.

Table 2: Health Spending in the OECD (% of GDP)

	2001 Actual	2001 Basic Age Adjustment	2001 Final Age Adjustment	Final Rank
Canada	**9.7**	**11.2**	**10.8**	**1**
Iceland	9.2	11.6	10.8	1
Switzerland	11.1	10.5	10.7	3
Australia	9.2	10.7	10.3	4
Germany	10.7	9.2	9.7	5
Korea (2000)	5.9	11.3	9.7	5
New Zealand	8.1	9.9	9.4	7
Netherlands	8.9	9.5	9.3	8
France	9.5	8.5	8.8	9
Denmark	8.6	8.5	8.5	10
Portugal	9.2	8.2	8.5	10
Greece	9.4	7.9	8.4	12
Belgium	9.0	7.8	8.1	13
Ireland	6.5	8.5	7.9	14
Norway	8.0	7.8	7.8	15
Sweden	8.7	7.4	7.8	15
Czech Republic	7.3	7.7	7.6	17
Austria	7.7	7.2	7.4	18
Italy	8.4	6.7	7.2	19
United Kingdom	7.6	7.0	7.2	19
Poland	6.3	7.4	7.1	21
Japan	8.0	6.6	7.0	22
Finland	7.0	6.8	6.8	23
Slovak Republic	5.7	7.3	6.8	23
Spain	7.5	6.4	6.8	23
Hungary	6.8	6.5	6.6	26
Luxembourg (2000)	5.6	5.8	5.8	27
Turkey (1998)	4.8	—	—	—
OECD Average	8.0	8.3	8.3	

Source: OECD, 2003; calculations by authors.

from 1980/1981 to 2000/2001 shows that real health expenditure (in 1992 dollars) on those aged 65 and over increased 93.7%, while their proportion of the population increased only 33.0%. In comparison, real health expenditures for the entire population increased 23.0% over the same period (Grenon, 2001). Using this information, it is possible to determine the increase in expenditures on health care as a share of GDP that occurred during an aging of the Canadian population (box 2).

This more rigorous estimation results in an estimated expenditure increase of 69.8% for every 100% increase in the senior share of total population. Using this adjustment factor, spending on health care as a share of GDP in Canada would have been 10.8% in 2001. Estimated health expenditures in Canada, assuming a senior's share of the population equaling the average of these countries, would have been 11% higher than without adjustment. Using this adjustment, Canadian expenditures on health care would have been tied with Iceland for the highest among industrialized countries in the OECD, not third as the first simple comparison (without age adjustment) suggested.

Some evidence for the validity of these adjustments can be ascertained from the OECD's own estimations of health spending increases that will result from aging populations in selected OECD countries (Dang et al., 2001). Using information supplied by Dang et al., it is possible to estimate that Canada will reach a dependency ratio of 24.4%, roughly equivalent to the average of the universal access

OECD countries studied by Dang et al., by approximately 2010 (Dang et al., 2001; calculations by authors). By that time, health expenditures are expected to have grown by 10% over spending in 2000 (Dang et al., 2001, calculations by authors).[3] These estimated spending increases are not far different from the final estimate of health spending in table 2. The estimate here, unlike that done in Dang et al., does not include the effects of GDP growth, technological advancements, and immigration over the ten years of aging that the Canadian population must undergo to reach a equivalent to the average of universal access OECD countries. The estimates undertaken for 2001 are simpler point-in-time estimates and do not look forward to a future time period.

Answer: After age-adjustment, Canada is tied with Iceland as the highest spender amongst industrialized countries in the OECD with "universal access" health care systems.

The final expenditure rankings for 27 OECD countries in 2001 with adjustments for the proportion of total population age 65 and over, using case 3 estimated above, are shown in table 2. After adjustment for the senior population, Canada would have had shared the honour of highest spending among industrialized countries in the OECD for the year 2001 with Iceland. Therefore, it is highly unlikely that a lack of funding is the reason that governments in Canada have difficulties delivering health services.

Box 2: A More Rigorous Age Adjustment Calculation

Cases 2 and 3 are based on the following formula:

1. (Senior's Proportion of Population, Base Country) = β_B
2. (Senior's Proportion of Population, Estimated Country) = β_E
3. $(\beta_B - \beta_E) / \beta_E = \lambda$
4. $\lambda * \alpha = \rho$; where α is the adjustment factor estimated to be the increase in health expenditure related to a 100% increase in the seniors' share of population.
5. (Health Expenditure [%GDP] Estimated Country) = π
6. $(\rho + 1) * \pi$ = Adjusted Health Expenditure

The estimation for α in case 2 is:

1. Increase in senior's share of population from 1980/1981 to 2000/2001 = 33.0%
2. Increase in senior's share of health expenditure from 1980/1981 to 2000/2001 = 22.0%
3. 22.0% / 33.0% = α= 66.66% = 66.7%

The estimation for α in case 3 is:

1. Increase in senior's share of population from 1980/1981 to 2000/2001 = 33.0%
2. Increase in total real health expenditure (share of GDP) from 1980/1981 to 2000/2001 = 23.0%
3. 23.0% / 33.0% = α = 69.8%

Canada as an example (case 3)

1. $\alpha = 0.698$ (69.8%)
2. $\lambda = (14.6 - 12.6) / 12.6 = 0.159$ (15.9%)
3. $\rho = \lambda * \alpha = 0.111$
4. $(\rho + 1) * \pi = 10.8$

Note: Values shown here for α are calculated from actual percentage increases that have been rounded for inclusion here.

Which countries other than Canada do not have cost sharing? A look at co-insurance and co-payments

Health insurance: the basics[4]

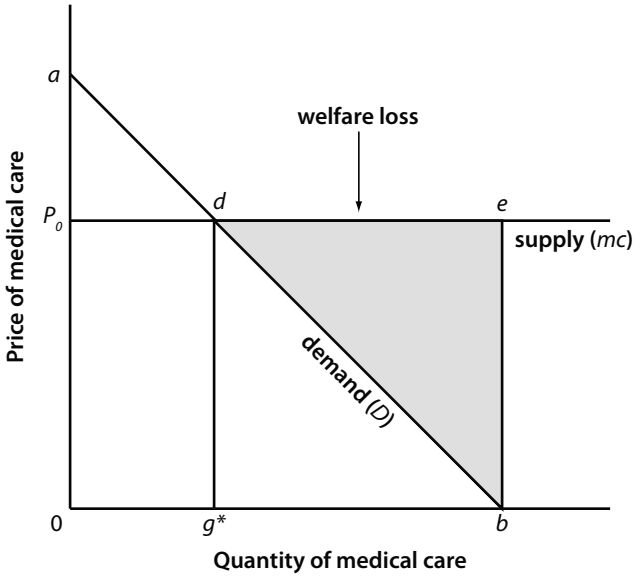
[*Readers interested only in the results may skip to page 22.*]

The development of health insurance, as of other insurance markets, is a result of the existence of uncertainty and risk. People pay a fee to an insurer in exchange for the insurer's promise to cover the costs they incur for specified illnesses. Where people attempt to maximize their happiness and are averse to taking risks, the purchase of insurance makes them better off than they would be without it (Arrow, 1963). As well, there is a social gain. Society as a whole benefits from the availability of insurance because risks are pooled among, or can be shared by, many people so that if a catastrophic event occurs, an individual is compensated for his loss out of the fees paid to the insurer by all who are insured against this risk.[5]

Insurance in general and health insurance in particular can, however, have distorting effects. One of these effects is "moral hazard": insured patients demand more services than they would in the absence of insurance. By lowering the marginal cost (the cost of the next unit) of care to the individual, health insurance encourages the use of health services (Pauly, 1968). As well, individuals covered by insurance will likely use more health services for an event than those who do not have insurance coverage (Arrow, 1963). If individuals do not face any charges (i.e., a third party—the government or a private insurance company—covers their medical expenses), they have no incentive to restrain their use of health care. This situation can produce excessive demand for care and can result in wasted resources, to the extent that the costs of producing these services exceed what individuals would be willing to pay for them if they had to pay directly. On the other hand, the absence of insurance may have the undesired effect of encouraging patients to delay seeking care, which may be more costly and harmful to their health than if they had received prompt treatment or medical advice. Obviously, a balance must be struck between the incentives to underuse, and the incentives to overuse, health care.

The phenomenon of moral hazard is illustrated in figure 2. The segment *ab* represents the demand for medical care *D* and the supply of medical care or the cost of producing each additional unit of care is represented by the line "supply (*mc)*." Assuming that the market for medical care is perfectly competitive (no one provider is large enough to affect average prices) and that providers maximize their profits, individuals would choose to consume g^* units of medical care at price P_o because, at this point, the cost of the next unit of medical care purchased is equal to

Figure 2: Welfare loss of insurance



Note: For the long run marginal (*mc*) curve to be perfectly elastic (i.e., horizontal), one needs to assume that the insurance margin is characterized by constant costs. However, this assumption can be relaxed. An increasing marginal cost does not invalidate the analysis; an increasing marginal cost curve would lead to an even larger welfare loss.

the value of the next unit of medical care received. At any point to the right of *d*, the cost of additional medical service is greater than its value to the purchaser, while to the left of *d*, the cost of additional medical service is less than its value to the purchaser. Thus, in economic terms, *d* is an equilibrium where supply equals demand and there is no waste of resources.

If individuals were to be fully insured so that the cost of health care fell to zero, however, they would consume *b* units of health care, where the benefit of extra health care is exactly zero. Thus with complete health insurance coverage, the allocation of resources would be inefficient as there would be over-consumption of health care and underpayment. The value of the last unit of medical care purchased would be far smaller than its actual cost. The welfare loss from such a policy, then, is the area *bde*. This area is equal to the value of the excess resources consumed. Note that this excess resource wastage is only one half the area of the total excess cost (½ (additional quantity × cost)) because the resources consumed still have some value to the patients.

If the demand for health care were perfectly inelastic (i.e., a vertical demand curve)—if no matter what the price, people demanded exactly the same quantity of care—no welfare loss would occur. The presence of elasticity in the demand curve implies that individuals are willing to demand and consume more health care when the price charged to them is decreased, and vice versa. Thus, more widespread insurance coverage will lead to greater insulation of people from the costs of health care as use increases. The benefits will fall to the few while the costs are spread among the many, which results in a greater potential for over-consumption of health care.

In insurance literature, moral hazard is often seen as a moral or ethical problem. However, moral hazard is more a result of rational economic behaviour than of lower morality (Pauly, 1968). Individuals may recognize that their excessive use of health care will result in higher premiums or higher taxes but their increase in benefits from over-consumption is large, while the incremental cost of their excessive use is small, because the entire insured population bears the cost.

On the one hand, health insurance increases social welfare because of risk pooling, while on the other hand, it introduces incentives to consume excessive amounts of health care. It is because of these two conflicting aspects of insurance that co-payments have been introduced as a method to reduce the welfare loss due to moral hazard, while preserving most of the welfare gain from risk pooling.

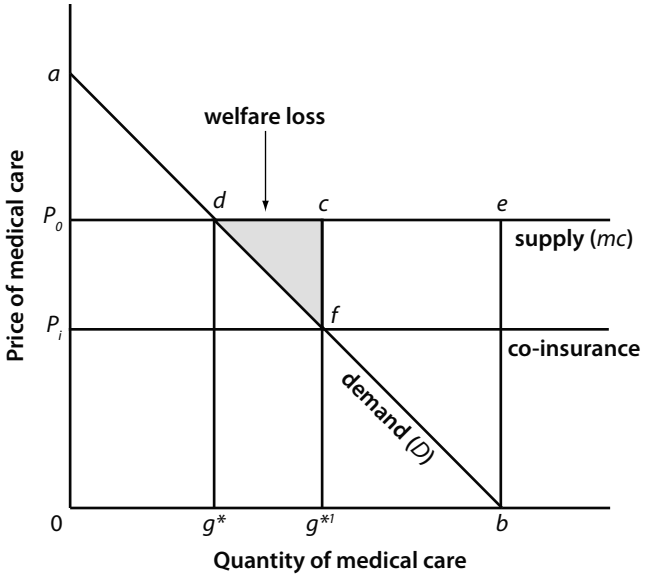
Co-insurance, co-payments and deductibles—the economics

Co-insurance

Co-insurance, deductibles, and co-payments are commonly used to control excessive use due to under valuation of insured consumption. Co-insurance requires individuals to pay some fraction of each dollar of cost (usually set as a percentage). For example, a health insurance plan with a 25% co-insurance rate will either require individuals to pay for a quarter of all expenses or only reimburse them for three quarters of all expenses. With co-insurance, patients pay a price for health care that is lower than the market price but greater than zero.

Figure 3 illustrates the effect of co-insurance on the size of the welfare loss. As noted above, individuals with a zero co-insurance rate (free care) will choose to consume *b* quantity of health care with an associated welfare loss equal to the area *bde*. If a positive co-insurance rate is introduced, individuals are now faced with an effective price P_i where P_i is less than P_o but greater than zero. The difference between P_i and P_o is the reimbursement rate or the counterpart to the co-insurance payment. This is the portion of costs that are insured when a non-zero co-insurance rate applies. Consumers will now demand g^{*1} units of health care, which is more than they would in the absence of insurance but less than the original consumption with free care. The welfare loss is now the area enclosed by *dcf*, which means that the welfare loss due to excessive insurance coverage has been reduced by the area *cebf*.

Figure 3: Welfare loss of insurance with co-insurance



Two important points about the co-insurance payment must be noted. The first relates to the earlier discussion of elasticity. The lower the price elasticity of demand is, the smaller the change in consumption resulting from a co-insurance payment will be, which will result in a smaller change in welfare loss—although the welfare loss would already be smaller than it would have been with a more price elastic demand curve. It is also important to recognize that as the co-insurance rate rises, the amount of risk borne by individuals increases because the potential for out-of-pocket costs rises with the co-insurance rate.

Co-payments and deductibles

Co-payments and deductibles work in a slightly different manner from co-insurance and may not have as significant an effect on the welfare loss in some cases but a far more significant effect in others. A deductible is the amount that a patient must pay out of pocket during a period (say $1,000 annually) before the insurer will start paying for his health care. For health spending below the deductible, the patient's use of health services will be similar to that of an uninsured person. For health spending beyond the deductible, the patient's use of health care will be similar to that of a person with insurance coverage from the first dollar. Thus, a deductible will either have no effect on an individual's use, or will induce the individual to consume that amount that would have been purchased in the absence of insurance (Pauly, 1968). Higher deductibles eventually introduce an income effect, where individuals are charged a deductible that reduces their income sufficiently so as to make the free care post-deductible less attractive (Pauly, 1968). Co-payments or user fees are a form of deductible applied to a given service—a $5 payment for a visit with a physician, or a $10 fee for emergency room visits, for example.

Co-insurance payments, co-payments, and deductibles have a number of advantages. The first is that they increase efficiency in the health delivery sector and reduce costs: if required to bear a portion of health care costs, individuals will curb their consumption of medical care, and medical services of lesser value will eventually be eliminated. A second advantage is that these payments can reduce the tax burden of Canadians because they redirect health care financing from taxpayers to users.

Opponents argue that user fees may increase administrative costs significantly because more resources must be devoted to their collection, that they may erect a barrier to care that may have adverse health effects and, finally, they may disproportionately shift the cost burden onto lower income individuals.

User fees and lower-income individuals

The main argument against the traditional forms of cost sharing is their distributional consequences.[6] Evans (1993) argues that the principal effect of introducing cost sharing in a tax-financed health care system like the Canadian system is cost shifting. If cost sharing reduces public expenditures on health care and the savings are used to reduce taxes, then it follows that taxpayers will pay less and users of health care will pay more in the form of deductibles, co-insurance, or user charges.

Evans believes that, as individuals with higher incomes tend to pay more taxes and less healthy individuals tend to consume more medical care, high earners pay a larger share of total health costs in a publicly funded system, like that in Canada, with little or no cost sharing. In a system where cost sharing is more pervasive, users of the health care system (i.e., the sick) tend to pay a larger share of the health care bill. It follows from this argument that the wealthy and healthy gain from cost sharing, while the poor and the sick lose out. As well, since income and health tend to be closely related, this positive correlation reinforces the intensity of the cost shifting.

Evans contends that this pattern of income redistribution from the sick to the wealthy is true of all forms of cost sharing, even if some proposals exclude the very poor and the very sick. If cost sharing is linked with income, then the cost shifting is mitigated but does not disappear. If some segment of the population (such as those individuals below a certain income level) is exempted from the cost sharing, cost shifting will still occur among the non-exempt population.

The argument that the wealthy and healthy benefit from cost sharing at the expense of the poor and sickly relies on the assumption that more cost sharing will result in lower taxes, which benefits high earners. It is not a certainty, however, that taxes will be reduced. Even if they were, the marginal tax rates of low-income individuals could be reduced, and certain consumption taxes diminished. As well, any savings from greater efficiencies in the health sector could be reinvested into the health care system itself. Moreover, it is not clear that lower-income and less healthy individuals lose more if cost sharing is introduced and taxes are reduced accordingly, since it is often high earners who benefit more from social programs such as education and health care (Le Grand, 1982; Horry and Walker, 1994).

Evans' argument depends upon three assumptions: (1) high earners tend, on average, to be healthier than poorer individuals; (2) the sick use more health care; and (3) high earners pay more taxes than poorer individuals. With these assumptions, it seems reasonable that cost

sharing would transfer income from the sick (and poor) to the healthy (i.e., from the ill-poor and ill-wealthy to the healthy-poor and the healthy-wealthy). Because the sick poor outnumber the sick wealthy, there could be a transfer from those with lower incomes to those with higher incomes. However, use of health services tends to increase with income and not decrease. Phelps (1992) demonstrated with data from the RAND Health Insurance Experiment (HIE) that the income elasticities for all episodes of illness were all positive, with the exception of hospital care, which was not significant (table 3). This evidence suggests that there should be a means test for the imposition of cost sharing, where individuals whose health status would be adversely affected by the imposition of cost sharing would be exempted from paying. Protection of the poor and ill should not result in the imposition of inappropriate incentives for all or forgoing a cost-sharing program that might well reduce the total costs of the system.

Co-payments and co-insurance—the evidence of their effects

Even if people are price conscious, it does not necessarily follow that total health care expenditures will decrease if they are given incentives to use the health care system more prudently. Those with higher incomes will have more resources with which to cover user charges and may, therefore, not decrease their use of the system despite the incentive to do so. Nevertheless, amongst the entire population, the existence of prices may lead to lower use of the health system, which may affect individuals' health status, thus potentially increasing health care costs in the future. The poor are particularly at risk and it has often been argued that the poor stand to lose if any form of cost sharing is introduced. There are several empirical studies that examine the effect of cost sharing on health outcomes and on the poor while others look at the significance of public health care spending on this segment of the population.

Feldstein (1973) compiled one of the most widely cited studies on the welfare loss of health insurance. He estimated this loss by looking at the welfare effects of increases in co-insurance rates and used time-series data for individual American states to estimate the demand for hospital insurance. The welfare effects were calculated by estimating the gross gain from reduced price distortion—with less insurance, prices more accurately reflect the true cost of the services—and the gross loss from increased risk bearing. Feldstein found that reducing health insurance produced significant welfare gains. These results and the fact that public insurance and non-hospital care are excluded (which understates the welfare loss) led Feldstein to conclude that the United States could significantly benefit from a reduction in health insurance—by more than $4 billion (1969 US$).[7]

Since there is a welfare loss associated with insurance, it follows that to maximize social welfare one must try to maximize the benefits of risk pooling of insurance while minimizing the welfare loss. Manning and Marquis (1996) have estimated the demand for health insurance and the demand for health services as a function of co-insurance rates, deductibles, and upper limits on out-of-pocket expenditures (or maximum dollar expenditure [MDE]) using experimental data from the RAND Health Insurance Experiment (HIE) in the United States. They have found a welfare loss of approximately $480 per family (1995 US$) associated with insurance.

Table 3: Income Elasticities for Episodes of Illness by Type of Care

Type of Care	Income Elasticity
Acute	0.22
Chronic	0.23
Well Care	0.12
Dental	0.15
Hospital	not significant

Note: Unlike price elasticities, income elasticities measure the positive (rather than the negative) relationship between income and the demand for health care. That is, for positive elasticities, as income increases, so does demand.

Source: Phelps 1992, calculated from Keeler et al., 1988.

The RAND Health Insurance Experiment

In the mid-1970s, the RAND Corporation, a California-based research institute, began what has turned out to be the most significant medical insurance study ever accomplished: the Health Insurance Experiment (HIE). The central focus of the HIE was to study the effect of cost sharing on medical service use and health status. Approximately 2,000 non-elderly families from six regions of the United States participated (no participant was over the age of 65 during the experiment). Participants were assigned to one of 14 fee-for-service insurance plans or to a prepaid group practice and were studied closely for a period ranging from three to five years. All of the insurance plans had a maximum dollar expenditure (MDE). The plans were as follows.

(1) One plan with zero co-insurance (free care).
(2) Three plans with 25% co-insurance and MDEs of 5%, 10%, or 15% of family income to a maximum of $1,000.
(3) Three plans with 50% co-insurance and MDEs of 5%, 10%, or 15% of family income to a maximum of $1,000.
(4) Three plans with 95% co-insurance and MDEs of 5%, 10%, or 15% of family income to a maximum of $1,000.
(5) Three plans with 25% co-insurance for all services except out-patient mental health and dental, which were subject to 50% co-insurance, and MDEs of 5%, 10%, or 15% of family income to a maximum of $1,000.
(6) One plan with 95% co-insurance for out-patient services and zero percent co-insurance (free) for in-patient services and an MDE of $150 per person subject to a maximum of $450 per family. This plan is known as the individual deductible plan.

Four dependent variables were used in the HIE's analysis of the effects of cost sharing on the use of medical services and on health:

(1) probability of using medical services;
(2) medical expenditures (includes all services except dental and out-patient mental health expenditures);
(3) annual number of physician visits;
(4) hospital admission rates.

The insurance plans were grouped into five categories:

(1) free care;
(2) 25% co-insurance rate (including the plans with higher rates for mental and dental care);
(3) 50% co-insurance rate;
(4) 95% co-insurance rate;
(5) individual deductible.

There was no differentiation made between the levels of MDEs because it was found that variations in the MDEs were not significant. Factors such as age, sex, race, family income, and family size were included in the analysis, along with four measures of health used to account for differences in initial health status:

(1) a General Health Index;
(2) the presence of a physical limitation;
(3) chronic disease status;
(4) a Mental Health Index.

The demand for medical services was then estimated using two econometric models, which yielded results that were quite similar. The results of estimates derived from the multi-equation model are summarized in table 4. When individuals have access to free medical care, there is an 86.7% chance that they use the health care system in a given year. As cost sharing increased from 0 (free) to 95%, there was a significant decline in both the probability that medical services would be used and in the medical expenses incurred per person in the population.

The last column in table 4 represents the total spending of each plan as a ratio of the free plan. On average, individuals on the 25% plan spent 19% less than those on the free plan; individuals on the 50% plan spent 25% less; while those on the 95% plan spent 33% less. Medical expenses per person fell from an average of US$1,019 (free) to as low as US$700 (95% co-insurance). The demand for all types of service fell with cost sharing, although some services were affected more than others. For example, not shown in table 4 is the fact that children's hospital admissions were less responsive to changes, while mental health services were more responsive.

The findings of the HIE challenge the claim that heavy cost sharing raises overall health care costs because of its incentive to delay seeking care. Total expenditures in the high co-insurance group (95%) were well below those in the free-care plan. It appears that the effects of incentives to delay seeking care were outweighed by other factors. Contrary to the cost-sharing incentive effects, changes in MDEs did not lead to significant changes in spending and health care consumptions. As the HIE estimates suggest that the risk associated with a higher MDE is not significant, the implication would be that MDEs should be set at the high end of the values examined (Newhouse et al., 1993).

As a result of having an MDE, the difference in the various co-insurance plans was far less than suggested by the nominal co-insurance rates. For example, the average cost-sharing rate was 16% in the 25% plans, and 31% in the 95% co-insurance plans (table 5). The lower average co-insurance rates result from there being a diminishing number of people who are subject to the co-insurance rate for the whole period as the rate increases. While the nominal co-insurance rate may be 95%, enough people managed to reach the MDE (after which care is free) that, on average, the rate was only 31% over the specified period.

There are two separate effects from increases in the co-insurance rate: individuals have to pay more, thus reducing use; and the likelihood of reaching the MDE increases as the level of co-payment increases for a given MDE. People contributing more per care episode will reach the limit for payments in fewer visits than would someone contributing less. Since health care is free once the MDE has been exceeded, more individuals will have access to free care when the co-insurance rate is high. Keeler et al.

Table 4: Predicted Average Annual Use of Medical Services for a Standard Population

Plan	Probability of any medical use excluding dental (%)		Medical expenses per person excluding dental ($1991)		Total spending as percent of free plan
	mean	t vs. free	mean	t vs. free	
Free	86.7 (0.67)	—	1,019 (43)	—	100%
25%	78.8 (0.99)	–6.69	826 (38)	–4.05	81%
50%	74.3 (1.86)	–6.33	764 (43)	–4.91	75%
95%	68.0 (1.48)	–11.57	700 (35)	–6.74	67%
Individual deductible	72.6 (1.14)	–10.69	817 (45)	–3.78	80%

Note: Standard errors in parenthesis. Estimates are predicted from a four-equation model developed by Duan et al., 1982, 1984. The difference in expenses between the 25% and 50% plans is significant at the 5% level ($t = 1.97$) and between the 50% and 95% plans is significant at the 6% level ($t = 1.93$).

Source: Newhouse et al., 1993: 44.

(1977) have stressed the importance of examining deductibles and co-insurance as part of a sequence and not in isolation. The HIE supports just such an argument.

Beyond the cost sharing results, the HIE is also one of a very few studies that examines the effects of cost sharing on health. The Insurance Experiment Group used five measures to examine participants' health: general health (physical, mental, and social), psychological health, health habits, prevalence of symptoms and disability days, and the risk of dying. The predicted values of health are estimated using several variables including age, sex, family income adjusted for family size and composition, and health at enrollment in the experiment.

On the whole, reduced services due to cost sharing had little or no net adverse effect on health (table 6). In addition, no significant differences in the risk of dying (for the average person) or measures of pain and worry were observed. Moreover, days of restricted activity dwindled with higher levels of cost sharing. The most important determinant of health at the end of the experiment was typically health at enrollment. (Newhouse et al., 1993).

The HIE also looked at the effect of cost sharing on the health of high-risk individuals, such as the poor and the sick poor.[8] The health of this segment of the population was severely affected by cost sharing—both mortality rates and blood pressure worsen among high-risk individuals. Thus, the HIE's findings support a co-insurance exemption for low-income groups.

The HIE also examined the appropriateness of the services that were forgone. Lohr et al. (1996) concluded that cost sharing reduces both necessary and unnecessary care. However, the type of cost sharing plan was found to have no effect on most measures of health and a decrease in necessary care should have resulted in lower health outcomes. Lohr et al. suggest that this phenomenon occurs because the loss of the benefits of consuming necessary care is counterbalanced by the decline in the harm done by consuming inappropriate services

Although the RAND HIE was performed almost 20 years ago and in the United States, it is not clear why Canadians should see the trade-off between health spending and having the money for other spending differently than their American counterparts. The HIE has also produced similar results in China in a study on the effect of cost sharing in that country (Sine, 1994). It is important to note, however, that the HIE looks only at the non-elderly population and that, therefore, the results may not be readily applicable to the elderly.

It is vital to recognize that most studies exploring the issues of user payments are conducted using data from the United States, a system with a roughly equal split of public and private health care funding, along with various cost-sharing regimes applied extensively throughout the system. The welfare losses associated with health insurance, then, could be expected to be much larger in Canada where health care financing is largely public and access is free at the point of service.

Table 5: Percentage of Families Exceeding the Maximum Dollar Expenditure (MDE) Limit and the Average Co-insurance Rate

Co-insurance rate (%)	Percent exceeding limit	Average co-insurance rate (%)
25	20.8	16
50	21.5	24
95	35.0	31

Source: Newhouse et al., 1993: 358–59.

Table 6: Predicted Health Status at the End of the RAND HIE, by Selected Health Measures and Insurance Plans

	Cost Sharing Plans				Free Plan	Average differences in health between the free plan and the cost sharing plans[a]		Size of sample
	95%	25%/50%	Individual Deductible	Average		Predicted	Actual	
Physical health[b]	86.0	85.0	84.9	85.3	85.3	0.0 (−1.6, 1.5)	−0.3 (−2.3, 1.7)	3,862
Mental health[c]	75.6	75.5	75.8	75.6	75.5	−0.2 (−1.1, 0.8)	−0.1 (−1.1, 1.0)	3,862
General health[d]	68.1	68.0	67.9	68.0	67.4	−0.6 (−1.5, 0.3)	−0.9 (−2.1, 0.3)	3,943

Note: Each measure of health is based on a scale of 100.
(a) 95% confidence interval in parenthesis.
(b) A decrease of 10 points in physical health measure represents what it would be like to have chronic, mild, osteo-arthritis.
(c) A decrease of 3 points in mental health measure represents an effect equivalent to how you would feel if you were laid off or fired.
(d) A decrease of 5 points in general health represents an effect equivalent to that of being diagnosed as hypertensive.

Source: Newhouse et al., 1993: 209.

Answer: Canada is one of only six countries that do not require cost sharing—21 of the "universal access" nations in the OECD do apply user fees of some sort.

Table 7 gives health care co-insurance, deductible, and co-payment information for 27 OECD countries. Of these 27, Canada is one of six countries that do not have cost sharing in the primary health care system for the major services of hospital care, general practitioner care, or specialist care. The other five countries are the Czech Republic, Denmark, The Netherlands, Spain, and the United Kingdom. France is only a pseudo-member of this group as the French health care system officially charges a *ticket modérateur* (which is the difference between reimbursement for services and the actual cost), but supplementary insurance—which covered some 80% of the population in 2000—is available to cover the majority of this co-insurance payment. Australia is also a pseudo-member as doctors may choose to forgo the cost-sharing component of their fee in return for the privilege of billing the public insurer directly for services—nearly 80% of services were billed this way in 2001. The remaining 21 countries (including France and Australia) all have some cost sharing in the public system for at least one of hospital care, general practitioner care, and specialist care.

Of the countries that do not require cost sharing for health services, one, the Czech Republic, is a former communist country still in the process of reforming its economy and social service system. Another is the United Kingdom where the National Health System is now in a state of disrepair, plagued by negative news reports and long waiting lists (Gage, 2001). Canada and Denmark have both experienced problems with long wait times for medical procedures (Walker with Wilson, 2001; Vallgårda, 2001). Growing waiting lists for elective surgery are also seen as a major challenge in the Netherlands (Or, 2002). These three countries are also above average spenders on health care as a share of GDP, spending 9.7%, 8.6%, and 8.9% of GDP respectively in 2001, or 10.8%, 8.5%, and 9.3% of GDP after an estimated adjustment for population age profiles. Finally, the Spanish NHS has been contracting with private providers and providing financial compensation to doctors willing to work longer hours throughout the country in an attempt to shorten waiting lists, which grew significantly between the mid-1980s and the mid-1990s (European Observatory, 2000f). Patients in Spain on waiting lists for more than six months have also been provided financial compensation to choose another public or contracted private hospital for care (European Observatory, 2000f).

Clearly, there have been problems of unsatisfied demand for care in at least five of the six countries, a result suggested by the moral hazard issues created by the absence of cost sharing and demonstrated in the RAND HIE. The remaining country, the Czech Republic, can be considered a "transition economy"; it is likely to make significant changes in its health system as the economy grows and advances and as health expenditures rise over time.

So, while Canada is not alone in banning user fees, it is in a distinct minority and other countries with no cost sharing also seem to have the same sort of cost control and service provision problems as Canada does.

Table 7: Co-Insurance, Co-Payments, and Deductibles in the OECD

	Cost Sharing*	Hospital	GP	Specialist	Pharmaceutical[1]
Australia	Yes[2]	No[3]	Yes[2]	Yes[2]	Yes
Austria	Yes	Yes	Yes	Yes	Yes
Belgium	Yes	Yes	Yes	Yes	Yes
Canada	**No**	**No**	**No**	**No**	**Yes**
Czech Republic	No	No	No	No	No[4]
Denmark	No	No	No	No	Yes
Finland	Yes	Yes	Yes	Yes	Yes
France	Yes[5]	Yes	Yes	Yes	Yes
Germany	Yes	Yes	Yes	Yes	Yes
Greece	Yes	Yes[6, 7]	Yes[8]	Yes[7]	Yes
Hungary	Yes[9]	Yes	Yes[7]	Yes[7]	Yes
Iceland	Yes	No[6]	Yes	Yes	Yes
Ireland	Yes[10]	Yes[10]	Yes[10]	No	Yes[10]
Italy	Yes	No[6]	No[11]	Yes	Yes
Japan	Yes	Yes	Yes	Yes	Yes
Korea	Yes	Yes	Yes	Yes	Yes
Luxembourg	Yes	Yes	Yes	Yes	Yes
Netherlands	No	No	No	No	No[4]
New Zealand	Yes	No	Yes	No	(N/A)
Norway	Yes	No[6]	Yes	Yes	Yes
Poland	Yes[12]	Yes	Yes[7]	Yes[7]	Yes
Portugal	Yes	Yes	Yes	Yes	Yes
Slovak Republic	Yes	Yes	Yes	Yes	Yes
Spain	No	No	No	No	Yes
Sweden	Yes	Yes	Yes	Yes	Yes
Switzerland	Yes	Yes	Yes	Yes	Yes
United Kingdom	No	No	No	No	Yes

* A country was regarded as having cost sharing if it had cost sharing in any one of hospital care, general practitioner care, or specialist care.
Note: All categories considered in this table are those that operate in the mandatory or public insurance scheme. Private insurance schemes are not considered.
(1) This category includes all non-hospital pharmaceuticals.
(2) Doctors in Australia may choose to accept 85% of the schedules fee for services as full payment (patients otherwise pay the full fee and receive 85% reimbursement from the national insurance program) in return for being able to bill the public health insurer directly. In 2001, nearly 80% of services were billed this way.
(3) Australian patients may receive hospital care free of charge but are expected to make a 25% co-payment of the schedules fee, plus any charges related to accommodation if they choose to use private hospitals and their choice of medical practitioner.
(4) Prescription drugs are not subject to co-payment but are subject to a reference-based pricing system.
(5) In France, supplementary insurance schemes generally refund some or all of the *ticket modérateur* (co-payment) of the basic scheme. In 2000, 80% of the population had supplementary insurance cover (Imai et al., 2000).
(6) Inpatient care is not subject to a co-payment, while outpatient care is.
(7) Doctors may receive gratuity payments for service.
(8) No co-payment is required for the use of public health centres in rural areas. In urban areas, where patients must make use of hospital outpatient departments, a co-payment applies.
(9) Although gratitude payments are considered part of the Hungarian system, they are difficult to measure and quantify. They are considered a cost-sharing mechanism as they are officially recognized.
(10) Patients unable to afford primary health care services are granted "Category I" status and provided a medical services card. This card allows Category I patients to receive health care services without a co-payment or deductible. A cost-sharing mechanism is in place for Category II patients, who pay 100% of GP fees and face co-payments and deductibles for other health services.
(11) Co-payments apply for diagnostic services.
(12) Patients in Poland may pay gratuity payments for care from public doctors. Since these payments are significant—one poll suggests that physicians double their salaries with these "envelope payments" (European Observatory, 1999c)—they are counted as a cost-sharing mechanism.

Sources: See Appendix A.

Which countries rely exclusively on government-managed hospitals to deliver publicly funded health care?

Private health care providers have often been a point of contention in Canada. When Bill 11 was introduced in Alberta, opponents of private care suggested that the introduction of private providers would lead to a system where richer individuals would pay more for better quality or expedited care, and that the quality of care for everyone else would not be improved by private firms (especially if operated for profit). These are two separate arguments requiring separate discussions. The first discussion focuses on the issues related to private provision of services within the government insurance scheme, while the second discussion approaches the issue of a private health system that operates alongside the public system.

The case for private provision

Though there has been a great deal of discussion about private versus public hospitals and their characteristics in recent history, it is insightful to look first at hospitals as business entities rather than considering them as "special," which most of the current debate about hospital characteristics intrinsically implies.[9] Unfortunately, to date, little discussion on the private provision of health services, especially hospital services, has considered the vast literature and evidence on the inefficiency of governments as service providers. An examination of the business and investment characteristics of public businesses will provide much needed insight in the discussion of private versus public hospitals that follows. Viewed as simple corporations, hospitals in Canada are best considered government business enterprises (GBEs).[10]

The differences between private- and public-sector business enterprises[11]

Before analyzing private care providers, one must first understand why private and public sector businesses behave differently. What follows is a survey of some of the main differences between private sector businesses and GBEs.

Kornai (1992) identified budget constraints as one of the major and unchangeable differences between private sector businesses and government. This is because government budget constraints are "soft" since it is effectively impossible for government to be de-capitalized. Private sector businesses, on the other hand, face "hard" budget constraints; if they incur sustained losses, or even a few large losses, the decline of capital can push them into bankruptcy. Kornai argued that this basic and unwavering difference between the two types of entities results in extraordinary differences in operations. Private sector businesses must provide consumers with the goods and services they demand in a timely manner and at affordable prices that are consistent with their quality. GBEs don't face the same constraints. They can consistently lose money by offering goods and services whose prices do not reflect their quality or timeliness.

Another pivotal difference between the two types of business enterprises relates to capitalization. Megginson and Netter (2001) found that GBEs tend to develop with less capital and thus are more labour intensive than their private sector counterparts. GBEs do not incorporate an optimal amount of capital, a fact that has negative implications for both labour and total factor productivity.

Part of this under-capitalization is inherent to the structure of GBEs. GBEs are nearly always restricted—if not forbidden—from raising equity financing, since additional equity financing would dilute the government's ownership. In addition, many GBEs are also restricted in their ability to raise debt financing, as the government ultimately secures their accumulated debt. This capital restriction can, and has, precluded GBEs from developing prudent business plans. In 1992, Butler found that privatization of state-owned enterprises often results in re-capitalization because governments tend to view capital spending in their businesses to be less important than distributing money to the very visible areas demanded by the public.

Clearly, private sector companies face very different incentives and risks than their public sector counterparts.

If this is the case, and the argument seems decisive, then why have GBEs in the first place? There is essentially one economic argument that can be used to justify the existence of GBEs in the health sector: market failure.

The argument from market failure says that a GBE can overcome a deemed market failure, such as the case in health care where it is suggested that the patient's lack of medical knowledge can lead to over-treatment by private providers. In such a scenario, the argument for the GBE is that it can provide the good or service at a level commensurate with a private provider. Empirical research has led largely to the refutation of this argument (Megginson and Netter, 2001).

The differences between private and public hospitals[12]

There is a substantial literature on the relationship between hospital ownership—private versus public, not-for-profit versus for-profit—and health care costs and outcomes. Each strand of inquiry provides compelling reasons to examine the social benefits from private provision of hospital services and, by extension, the private provision of doctors' services.

While there are a number of meaningful distinctions between the economic decision environments facing not-for-profit and for-profit firms, the salient one here is that if not-for-profit decision makers "are unable to extract residual income in the form of cash … [they] will choose to take it in other forms" (Pauly, 1987). Among these "other forms" are "better office facilities, more congenial colleagues, more relaxed personnel policies, or any other personally rewarding activity even if it is more costly to the non-proprietary (not-for-profit) hospital than its proprietary counterpart" (Clarkson, 1972). In other words, rather than solely maximizing profits, managers in the not-for-profit setting may be willing to sacrifice profits in order to enhance their own pecuniary and non-pecuniary income.

Thus, there is little value in the debate between for-profit and not-for-profit private providers. Though there has been a notable amount of media attention for a recent comparison of the two by Devereaux et al. (2002), critics have noted that the findings were not significant—the margin of error was equal to the adverse effect measured—and that the methodology used in the article was flawed (Gratzer and Seeman, 2002; Naylor, 2002). Clearly then, there seems to be little evidence to suggest that there is a difference between the operating characteristics of a not-for-profit private provider and a for-profit private provider.

The next comparison should then focus on the differences between public and private providers of health care. Like a private, not-for-profit provider, public hospitals have no ability to extract residual income from operations. Consequently, the manager of a public hospital does not trade off profit for non-pecuniary income; rather, he maximizes his budget, which enables the acquisition of greater pecuniary and non-pecuniary income (Niskanen, 1971). Therefore, the level of output of the public enterprise is higher than would be found in an otherwise equal private enterprise and the input combinations used also differ from that employed in a comparable private firm. Both disparities reflect inefficiency, as elaborated in a model proposed by Lindsay (1976).

Simply put, Lindsay found that public managers would be motivated to "divert resources from the production of attributes which will not be monitored [by politicians] to those which will" (Lindsay, 1976). This means that, in a public hospital setting, a disproportionately large amount of measurable and expensive equipment might be supplied along with a disproportionately small amount of politeness or clean floors, both of which are harder to measure. Because immeasurable attributes cannot be monitored effectively in a government enterprise but can be monitored in a private enterprise, public managers and bureaucrats will refuse to fund the provision of such immeasurable attributes while private firms *will* fund them (Zelder, 1999, emphasis in original). It is also notable that these hospitals will also be subject to public budget constraints and will therefore under-invest in capital-intensive forms of production, much like in the comparison of GBEs to private business enterprises. An example of this under-investment can be found in the diffusion of MRI machines in France, where the increase of MRI equipment per capita occurred more rapidly in private hospitals than in public hospitals (US Congress, 1995). A similar example also exists in Greece, where private clinics were the first purchasers of, and continue to be the principle providers of, access to high-tech diagnostic machines (European Observatory, 1996b).

Though there is often concern that private providers will offer a lower standard of care because of their ability to retain profits, there is a substantial body of evidence to show otherwise. Hsia and Ahern (1992) concluded that not skimping on care under prospective payment would produce significantly higher profits, while Cleverley and Harvey (1992) concluded, admittedly using a small sample of hospitals, that poor quality hospitals were less profitable. Annette Tomal (1998) found that higher prior-year profit margins in both for-profit and not-for-profit hospitals were associated with a lower hospital mortality rates. Clearly, the profit motive is not necessarily a source of reduced quality care.

For-profit hospitals in the United States have also been known to reinvest profits from operations rather than pay out profits as dividends to shareholders (Graham, 2002). These for-profit hospitals in the United States also hold more capital and fewer financial investments than do

public hospitals in Canada (Graham, 2002), echoing the earlier finding that GBEs tend to be under capitalized.

In general, the literature indicates that for-profit and private not-for-profit hospitals are equally efficient but that there are distinct efficiency advantages in relying on for-profit hospitals vis-à-vis publicly owned hospitals.

Further, private providers, because of their incentives to increase efficiency and provide a higher level of care in order to attract more patients, will end up enhancing care for all patients including the very poor. Evidence from the United Kingdom has also shown that the lower socioeconomic classes benefited the most from the private sector's involvement in hospital care provision (McArthur, 1996).

Answer: Canada is one of 12 OECD countries that rely exclusively on public hospitals to deliver publicly funded health care.

Table 8 contains information on 28 OECD countries and their level of private provision of publicly-funded hospital care. It gives information on whether the organizations that practice within the category are public, private, mixed, or heavily regulated. Heavily regulated private sectors should be seen as pseudo-public as the level of public intervention into their operations is high enough to be considered the same as direct control. Less than half of the 28 countries in table 8 rely on fully public or heavily regulated hospital sectors to deliver publicly-funded care.

A significant proportion of the countries that have strictly public provision of health services have experienced problems with long waiting times. Australia (Hilless et al., 2001), Canada (Walker with Wilson, 2001), Denmark (Vallgårda, 2001), Finland (Järvelin, 2002) Iceland (World Health Organization et al., 2000), Norway (European Observatory, 2000d), Portugal (European Observatory, 1999d), Sweden (Carroll et al., 1995; Hjortsberg et al., 2001), and the United Kingdom (Carroll et al., 1995) have all had problems with long waits for surgical procedures in recent years. Three of the countries with strictly public provision, Poland, Slovak Republic, and Hungary, are transition economies that are still in the process of transforming their economies and their social service systems.

Although Canada is not alone in having a heavily regulated or purely public hospital sector, all of the countries that rely on publicly owned providers seem to have the same sort of cost control and service provision problems that Canada does. Furthermore, as we shall see in a subsequent section, Canada is alone in prohibiting parallel private health care delivered by private hospitals.

Table 8: Ownership Status of Providers to Public Health Systems in the OECD

	Hospital Ownership Status
Australia	G[1]
Austria	M
Belgium	M
Canada	**PR**
Czech Republic	M
Denmark	G[1]
Finland	G
France	M
Germany	M
Greece	M
Hungary	G[1]
Iceland	G
Ireland	M
Italy	M
Japan	M
Korea	M
Luxembourg	M
Netherlands	M
New Zealand	M
Norway	G[1]
Poland	G
Portugal	G[1]
Slovak Republic	G[1]
Spain	M
Sweden	G[1]
Switzerland	M
Turkey	M
United Kingdom	PR

Note: G=public ownership, P-private ownership (either for-profit or not-for-profit), M=public and private providers both serve the public system, R-pseudo public management through regulation
Hospitals that serve only the private system are not considered in this table.
(1) A small minority of providers to the public system are private.

Sources: See Appendix A

Should Canada put its doctors on salary?

[*Readers interested only in the results may skip to page 30.*]

Methods of paying doctors

Supplementary to the discussion of private hospital care is that of physician remuneration. Noting the large differences in economic incentives and the resulting efficiency of provision above, it is not surprising to find that there are also large differences that result from different payment schemes for doctors.

Doctors may be paid by one of three methods: salary, capitation payment, or fee-for-service. Each of these principal payment methods has advantages and disadvantages that result from the degree to which the payment method is related to actual physician output. Doctors can also be paid through a mixed system that incorporates two or all three of these payment methods in an attempt to capture the positive effects of each, while mitigating the negative.

Salary

Salary schemes allow direct control of costs, as there can be no variability in payment as a result of extra output. This also means that under-production is possible as doctors will not have an incentive to produce beyond a minimal standard, both quantitatively and qualitatively. Thus, positions under salary payment must be supervised to maintain their rate of output (Feldman et al., 1981).

Capitation

Falling part way between a fully activity-based rate of pay and salary is the capitation payment system. Capitation payment systems provide a fixed payment to General Practitioners based on the number of patients registered to their practice. This payment is meant to provide physician services and diagnostic care for the patient; high-cost services (hospitals and specialists) will usually fall outside of the capitation scheme. These systems allow for careful control of health expenditures, just as with salary-based doctors, but also create an incentive for physicians to treat more patients as a greater number of registered patients will mean a higher income. Unfortunately, these systems can also lead to over-registering and under-servicing of patients, adverse selection of better risks to reduce outflows of money, and over-referral to high-cost care providers (hospitals and specialists) when the referring doctor could have treated the patients (Oxley and MacFarlan, 1994).

Fee-for-service payments

Fee-for-service payments, unlike the two mentioned above, are linked solely to output; no payments are associated with inactivity. While capitation payments and salaries allow physicians to under-produce while maintaining or even increasing income, this method of remuneration is a strictly activity-based rate of pay, where the number of patients actually treated determines the physician's income. This gives a physician full discretion over the level of service and all referrals but does lead to some variability in income, which may be undesirable in sparsely populated regions. According a recent OECD study, countries that rely on fee-for-service remuneration have a lower probability of experiencing problematic waiting times (Siciliani and Hurst, 2003), a finding that is broadly consistent with the existing literature on the superiority of this method of remuneration.

Further evidence on the benefits of a fee-for-service remuneration policy over both capitation and salary payment schemes can be found in a number of studies investigating the effects of various payment schemes. Wilson and Longmire (1977) found, in a comparison of six hospitals, that surgeons in the two fee-for-service hospitals performed almost 50% more procedures in a month than did the surgeons in the two salaried hospitals. Ransom et al. (1996), comparing the number of services performed in a single gynaecology clinic under varying payment schemes, found that the number of procedures performed fell 15% when physicians moved from a fee-for-service scheme to a salaried payment scheme. They also

noted that the number of elective procedures was most affected by the change in remuneration. Finally, Gosden et al. (2001), in a review of the literature, suggested that the quantity of primary care services provided by physicians was higher under a fee-for-service regime when compared with a capitation payment regime.

Though fee-for-service provision is clearly the superior choice for remuneration in terms of the quantity, and possibly the quality, of care provided, the control over income has often led to suspicions that physicians expand the volume of services they provide by recommending unnecessary care. The principal argument for this belief is that health care is a special good that cannot be traded in a normal market because of information asymmetry. This problem arises from the fact that patients are not likely to know their precise health care needs or the costs of those needs prior to visiting a doctor and must rely on the doctor for diagnosis and suggested treatment. Since doctors in private practice who earn money based on the quantity of treatment given can extract residual income in the form of cash (i.e., earn a higher income from greater income in their practice), they will have an incentive to recommend a higher level of treatment than would be cost-effective for the patient. This is known as supplier-induced demand.

Supplier-induced demand[13]

The size of the literature about supplier-induced demand (SID) requires a complete and detailed review impossible in this publication. Ferguson (1994), however, provides a basic review of different interpretations of SID. He divides models of inducement into four categories:

- market-level models;
- individual model;
- physician response to price incentives
- small area variation (SAV).

Market-level models

Ferguson analyzes three types of market-level models. First, he examines models that are built on the idea that an increase in the number of physicians will increase the use of health care and thus increase costs. Essential to this hypothesis is the notion that this increase in use is not medically necessary (i.e., it will not improve a patient's health). Studies that examine the relationship between the use and the supply of physicians usually use a basic model that assumes that the number of medical services demanded is determined by the number of physicians and other variables such as price, waiting time, and income. Studies that use this method (Fuchs and Kramer, 1972; Fuchs, 1978; Richardson, 1981) are seen as the backbone of SID theory. Fuchs' results (1978) show that a 10% increase in the number of physicians leads to a 3% increase in demand for health care. However, both sides of the SID debate have heavily criticized this type of study.

Second, Ferguson examines disequilibrium models. It is often argued that because of its complexities (e.g., public insurance and subsidies) health care markets will always be in a state of disequilibrium; that is, the supply of health care will never equal the demand for it. Cromwell and Mitchell (1986) and Ferguson and Crawford (1989) use disequilibrium models to test the SID hypothesis. Cromwell and Mitchell find that a 10% increase in surgeons per capita leads to a 0.9% increase in all surgery per capita and a 1.3% increase in all elective procedures per capita.[14] Ferguson and Crawford find evidence of persistent disequilibrium but no support for the SID hypothesis.

Third, Ferguson (1994) examines models of imperfect competition. Stano (1987) finds that SID is more important when the local medical market is closer to a monopoly (i.e., when there are very few physicians providing services). As the supply of physicians increases, the importance of SID diminishes. Ferguson concludes his review of market level models by stating: "neither the equilibrium or disequilibrium market-level models … give much support to the SID model" (1994: 73).

Individual-level model

Individual-level models use micro-level data rather than the market-wide data used by market-level models. Stoddart and Barer (1981) use data from 1,300 British Columbia families who received ambulatory care in 1973/1974. Their results support the inducement hypothesis. However, there are several serious econometric problems with the study (Ferguson, 1994). For example, Stoddart and Barer use a test that compares the R^2 values of equations with different variables. (R^2 values represent the proportion of the change in the studied variables that is explained by the other variables in the model of equations.) Comparing R^2 values between equations—let alone those of equations with different variables—is not considered proper econometric analysis.

Ferguson (1994) also examines the work of Wilensky and Rossister (1981, 1983), which uses data from the 1977 US National Medical Care Expenditure Survey. They test supplier-induced demand by estimating the effect of the availability of physicians on several variables, such as the probability of physician-initiated visits, the number of visits to the physician, expenditures on services, and the likelihood

of services being used. Wilensky and Rossister's results indicate that the availability of physicians has a positive but small effect on the dependent variables:

> What should be clear for even the most casual observer is that the idea is now dead that a large component of physician self-interested, self-created demand exists in response to changes in the supply of physicians. It can happen and does happen; but its policy relevance is small. (Wilensky and Rossister, 1981: 626)

Tussing (1983) and Tussing and Wojtowycz (1986) use a method similar to that of Wilensky and Rossister. Using 1981 data from a survey of health care use in the Republic of Ireland, they find support for the SID hypothesis: the supply of physicians increases the number of physician-initiated doctor visits.

Physicians' response to price incentives

The SID literature has recently devoted particular attention to physicians' responses to price incentives (e.g., fees). Ferguson (1994) points out that there is no consensus in the literature on how to formulate this hypothesis. For example, some argue that a decrease in fees followed by an increase in the quantity of services supports the SID hypothesis because physicians are trying to maintain their income level. Others argue that an increase in services that follows an increase in fees is also evidence of SID because physicians now make more money per visit and, therefore, they induce unneeded visits. Ferguson writes:

> Rice (1984: 156) claims that his results show that physicians induce extra demand in the face of lower fees, while Krasnik et al. (1990: 1701) argue that their results show that physicians induce demand in response to higher fees. If we accept both results, then we are back in the situation of having an untestable hypothesis, since any response to changes in fees could be taken as evidence of inducement. (1994: 109–10)

Hickson, Altemeier, and Perrin (1987) examined the response of medical service providers to price changes. They constructed an experiment: 18 paediatric resident physicians in a paediatric clinic were assigned randomly to two group practices (fee-for-service and salary). The results showed that the fee-for-service physicians scheduled more visits, provided better continuity of care, and were responsible for fewer visits to the emergency room. Salaried physicians missed more visits recommended by the American Academy of Pediatrics than fee-for-service physicians. The effect on total costs was not clear because fee-for-service physicians had increased costs due to more office visits, but also reduced costs from less use of emergency room care.

Small area variation (SAV)

The literature about small area variation (SAV) examines the reasons why geographic regions with similar populations and similar incidences of illness use physicians' services at different rates. Most studies of SAV have found a significant relationship between the availability of resources and their use. (For a review of the literature, see Paul-Shaheen, Clarke, and Williams, 1987; and Joseph and Phillips, 1984.) Intuitively, it makes sense that, if more resources are available to patients, they will take advantage of them. If a previously unavailable eye-laser surgery that can help patients with glaucoma see better becomes available, it is not surprising that glaucoma patients will opt to have the procedure performed. This positive relationship between resources and use, however, is often used as evidence of SID (see, for example, Folland and Stano, 1989; Wennberg, Barnes, and Zubkoff, 1982; Park et al., 1986; Vayda, 1973; and McPherson et al., 1981.)

Ferguson, despite reviewing numerous articles, finds no support for the theory of SID. He also stresses the weak quality of the methodology:

> The methodology of the literature has been surprisingly poor, considering the importance of the policy implications that have been derived from it … There is virtually no testing for [model] misspecification … Of the literature we reviewed, the only paper to include a set of misspecification tests is that by Rochaix (1993) … In fact, the SID model is virtually never tested … the few times this has been done … SID fails. (Ferguson, 1994: 124–27))

Feldman and Sloan (1988) also perform a review of the SID literature and reject the SID hypothesis:

> This literature suggests that demand inducement may occur in the market for surgical services but its extent is less than previously estimated. Little evidence for demand inducement is found in the primary care physician market. (Feldman and Sloan 1988: 258)

Rice and Labelle (1989) are critical of Feldman and Sloan's conclusion, arguing that the latter omitted several important studies that contradict their conclusions. Rice and Labelle state: "there is a great deal of evidence to indicate that physicians do induce demand for economic gain" (1989:

588).[15] The Saskatchewan Experiment (Beck and Horne, 1980) is often presented as evidence that physicians do, in fact, induce demand. However, Beck and Horne do not conclude that their findings are necessarily the result of SID.

Despite the increasing number of papers dealing with SID, it does not seem that a consensus is likely. Feldman and Sloan note, "few participants in the debate show any sign of changing their positions" (1988: 239). This lack of consensus offers little comfort to policy makers who must attempt to estimate physician response to the introduction of financial incentives in the Canadian health care system. One thing is certain: there is a great deal of uncertainty surrounding the SID hypothesis. Further, Newhouse (1993) suggests that there is strong evidence that even if physicians induce demand, they will not be able fully to offset the decrease in demand arising from increased cost sharing. As well, Tussing touches a very interesting point: "Patients are more likely to resist demand stimulation when their out-of- pocket costs are high" (1983: 229). In other words, providing individuals with financial incentives may make it harder for physicians to induce demand. Finally, there is the issue presented by Newhouse (1993):

> Usually the assumption is that an informed consumer would not value the induced demand at its cost. This assumption, however, need not be valid. For example, if one of the non price mechanisms used to equilibrate the market is time spent per patient, which certainly seems plausible on a day-to-day basis as a physician's patient load fluctuates, a decrease in overall demand from greater cost sharing may lead physicians to spend more time per patient and bill for longer visits. This might be termed supplier-induced demand—but patients might prefer it … Turning the argument around, suppose overall demand increases because of less cost sharing, with a resultant decrease in time spent per patient. If patients preferred longer visits (and were willing to pay for them), should this be termed a supplier-induced decrease in demand? (1993: 369–70)

Is Canada the only country to pursue fee-for-service payments to doctors?

Table 9 contains information on 28 OECD countries with information on whether physicians (GPs and specialists) are salaried, paid capitation fees, or paid through a fee-for-service arrangement. When comparing physician payment

Table 9: Doctors' Remuneration in Public Health Systems in the OECD

	General Practitioner	Specialist
Australia	F[2]	S / F
Austria	CF / F / S	S / F
Belgium	F[1]	F[1]
Canada	**F[2]**	**F[2]**
Czech Republic	CF	F
Denmark	CF	S / F
Finland	S[3]	S
France	S / F	F
Germany	F	S / F
Greece	S / F	S / F
Hungary	CF[2]	S
Iceland	S	(n / a)
Ireland	C / F	(n / a)
Italy	CF	S
Japan	F[4]	S / F[4]
Korea	S / F	S / F
Luxembourg	F	F[2]
Netherlands	C	F[2]
New Zealand	C / F	S
Norway	S / SF	S / SF
Poland	C / S	S
Portugal	S[3] / F	S
Slovak Republic	C	S / F
Spain	C / CS	S
Sweden	SF / F	SF
Switzerland	F	SF / F
Turkey	(n / a)	S
United Kingdom	CF	S

Notes: S = salary, F = fee-for-service payments, C = capitation payments. Two payment schemes listed together (e.g., SF) indicates a mixed remuneration system consisting of the methods indicated. Two payment schemes listed with a break (e.g., S / F) indicates two separate payment schemes administered in the system, where a portion of the doctors will fall under each remuneration scheme. All providers considered in this table are those who operate in the mandatory or public insurance scheme. Private system providers are not considered in this table.
(1) A small number of physicians in this category receive capitation payments.
(2) A small number of physicians in this category are salaried.
(3) A small number of physicians in this category receive mixed salary, capitation, and fee-for-service payments.
(4) In Japan, no distinction is made between GPs and specialists. All services are provided by both types of doctors according to a standardized fee schedule.

Sources: see Appendix A.

systems, Canada is clearly in the majority, as most OECD countries finance, at least partly, their GP and specialist care under a fee-for-service system. In the case of GP care, only nine countries have a strict salary payment system in place for general practitioners though seven of these countries do not rely solely on salaried general practitioners as they offer alternative payment schemes for doctors. Both countries that rely exclusively on salaried GPs (Finland and Iceland) have had problems with long wait lists (Järvelin, 2002; World Health Organization et al., 2000).

In comparison with the nine countries that pay GPs through salary schemes, there are 18 countries that have a strict salary payment system in place for specialists. Of these, nine have alternative (non-salary) remuneration schemes for specialists depending on where they are employed, or in what capacity. The remaining nine countries that rely on exclusively salaried specialist care have all been identified as countries with problems of rationed care—systems still in transition, along with transition economies, or health care systems that can be categorized as similar to those found in transition economies. Finland has had high waiting lists in the past and continues to show large regional variations in waiting time (Järvelin, 2002). Spain has also had a number of problems with wait lists for medical procedures (European Observatory, 2000f), as have the United Kingdom (European Observatory, 1999e), New Zealand (French et al., 2001), Italy (Donatini et al., 2001), and Portugal (European Observatory, 1999d). Both the transitional economies of Hungary and Poland also have strictly salaried specialist care. This is also the case for Turkey, where the provision and financing of health care, due to fragmentation, have left many vulnerable groups with inadequate health care coverage (European Observatory, 1996c).

The consequences of reliance on salaried physicians are quite clear in this case. All of the countries that have pursued this system of payment have ended up in a situation where there are long waits for health care or where gratuity payments provide much of the care that patients desire. Fortunately, Canada has not fallen into this situation. Although there are a number of design flaws in the Canadian system that have resulted in rationing of care and high levels of spending, the payment of physicians has been designed around an incentive system that works to attenuate some of these problems.

Answer: International experience suggests that Canada should not place physicians on salary and that, on balance, the current fee-for-service system is the best means of physician remuneration.

Does Canada have too many doctors?

When considering the remuneration of health care providers, the topic of how many doctors are available to the system becomes vital to determining whether the effects of these remuneration systems are being accounted for. It is possible that countries with a salary system have simply compensated with very large numbers of doctors in order to mitigate the problems associated with reduced output from salary payments. It is also possible that countries with appropriate incentives for physicians have regulated the supply of physicians to an extent that has diminished the positive aspects of increased quantity that would result from this system of payment. Further, increased doctor numbers have been strongly and significantly associated with lower mortality over the last 25 years (Or, 2001).

There are some health policy analysts who deny that the Canadian system is experiencing a shortage of physicians by pointing to the increase in doctors per capita since the introduction of taxpayer-funded health care as proof. Indeed, the number of doctors in Canada has risen from one for every 950 Canadians in the 1960s to one for every 550 in 1999 (Rachlis et al., 2001; Barlow, 2002).

However, the fact that the number of doctors per capita in Canada has risen does not, in itself, prove that Canada has no shortage of doctors. There must also be some accounting for the increased demand for medical services on the part of patients, which is not possible in Canada where no marketplace for physicians' services exists. What is possible is a comparison of Canada's experience with that of other OECD countries where consumers of health are able to determine, through parallel private systems or market mechanisms in the public system, what the growth in the number of physicians per capita should be.

Since many of these countries have a larger proportion of the population over the age of 65 than does Canada, it is likely best to compare the number of physicians after some adjustment for the age of the population. Like health expenditures, where the elderly consume far more resources than other proportions of the population, medical professionals are likely to be needed at a higher rate as the population ages. Since there are no documented studies quantifying the increased use of physicians as the population ages, it seems most logical to apply the same proportional increase in spending used above to the adjustment of physicians (from box 2 above, this means that $(\rho + 1)$ is now multiplied by the number of physicians instead of the health expenditures), since increased use of physicians is likely to rise roughly proportionally to increased use of all health services. Unadjusted ratios of physicians to population are given in appendix B.

In 2001, Canada ranked sixteenth out of 23 OECD countries in a comparison of age-adjusted doctor-to-population ratios (table 10). That year, Canada had 65,226 doctors (OECD, 2003). In order to rank with equally developed countries, Canada would have needed a significantly larger number of doctors. For example, in order for Canada's 2001 ranking to equal that of first-ranked Austria, the number of doctors would have had to be higher by approximately 25,500—a 39% increase.

Although the number of doctors per capita has increased over time, it is important to consider the rate of growth of doctors (age-adjusted) in other countries. In 1970, Canada had an age-adjusted ratio of 1.5 doctors per 1,000 people, the second-highest ratio among ten OECD countries for which data were then available. Since 1970, however, all of these countries have bettered Canada's growth in doctors per capita. While the age adjusted proportion of doctors in Canada grew by 58% over the period, the average increase in the proportion of doctors in the other nine countries was 138%.

In the 29 years between 1970 and 1999, Canada's doctor-per-capita rank fell from second of ten countries to sixteenth of 23 countries. This is particularly remarkable given that in 2001, Canada was tied for first with Iceland in age-adjusted health spending as a percent of GDP. Comparatively, the health care sector should have enough

resources to provide for many more doctors than we now have. The long and growing waiting lists suggest that we could certainly employ more physicians to advantage.

Answer: Canada has too few doctors by comparison with other similar countries, and ranks sixteenth in this respect in the OECD.

The fact that there are more doctors per capita in Canada now than at any time in the past is not a decisive argument against claims of doctor shortages. Every OECD country has more doctors now than in 1970. What is clear is that Canada has a relative shortage of doctors compared to other, equally developed, OECD countries and, in fact, compared to many less developed countries. It is also clear that the ratio of doctors to population is, comparatively, much lower than it was 30 years ago when the current medicare system was launched.

Table 10: Age-Adjusted Comparison of Doctors per 1,000 Population for Select OECD Countries

Rank	Country	2001
1	**Austria**	3.2
2	**Czech Republic (2000)**	3.1
3	**France**	3.1
4	**Finland**	3.0
5	**Germany**	3.0
6	**Norway**	2.9
7	**Denmark**	2.9
8	**Hungary**	2.8
9	**Belgium (1998)**	2.8
10	**Australia**	2.8
11	**Luxembourg**	2.7
12	**Portugal**	2.6
13	**Greece**	2.6
14	**Sweden (2000)**	2.4
15	**Switzerland**	2.4
16	**Canada**	**2.3**
17	**Slovak Republic**	2.3
18	**Poland**	2.2
19	**United Kingdom**	2.1
20	**New Zealand (2000)**	1.7
21	**Spain (1998)**	1.6
22	**Netherlands**	1.4
23	**Turkey**	1.3

Note: Figures for Turkey were not age adjusted due to remarkably low dependency ratios that were not conducive to meaningful adjustment.

Source: OECD, 2003; calculations by authors (see Box 2, page 17 above).

Do other countries follow Canada's model of monopolistic public provision of health insurance?

Whether or not health services should be available that are fully provided by the private sector, outside of the public or mandatory scheme, has been a topic of heated debate in Canada. Many people have referred to this "second tier" as an "Americanization" of health care, and claim that it is a horrible idea even to consider allowing individuals to attain expedited care outside of the rationed public system if they choose to spend their own income to do so. Much of this argument appears to revolve around the concept of egalitarianism, where it is often assumed that the poor not only deserve better care than their incomes would provide but deserve the same care that even the most wealthy in society enjoy. Implicit in this concept is that the wealthy should be forced to consume health care of a lower standard than their incomes would provide. The only standard of care available to anybody should be the standard that can be offered for the entire population.

The argument against a comprehensive private health sector in Canada appears to be far more emotional than evidence based, and there are a number of compelling arguments suggesting that a comprehensive supplementary health sector should be permitted.

Among the arguments for a comprehensive private system is one that centres on the principal tenets of capitalism and worker motivation: individuals work hard to earn more money so that they may enjoy a higher quality of life. Disallowing a private health sector, as Canada does, means denying people the right to spend their own earnings on goods that would benefit them. This is "tantamount to depriving the benefactors of humanity of the most precious form of reward for the benefits they have bestowed" (Selick, 1995). Individuals who have worked hard for many years and decide that they wish to use their own earnings to enjoy above-average health care in their old age will not be allowed to do so. Simply put, a private-sector provider formed to supply health services, which are also offered by the public insurer, allows individuals to use their own earnings in a way which benefits them the most and allows private health care providers to tailor special services for those willing to pay for them.

A second argument is one of research and development. It is well understood that the technological advances we all enjoy today have been financed, at some point, by the very wealthy. Today, we can all drive cars and visit websites on the Internet using our personal computers. There was a time when both forms of technology were prohibitively expensive and available only to the very wealthy, who then purchased these goods and helped finance their advancement to a point where they became available to everyone. All innovative new technologies begin life as the speculative gambles of the few who have wealth to spare and only eventually become cheap for the masses. There is little reason to believe that this is not the case for health care where markets are permitted to function.

Finally, the monopolization of health care, which happens when the government supplier disallows private health care, means that individuals have no effective choice in the health care they receive. Without effective choice, health care delivery becomes a common, uncontested standard, leaving patients in a situation where they cannot protest for better quality by choosing to purchase health services from a different provider. Monopoly provision of care also abolishes the need for hospitals to be efficient and innovative due to a lack of competition. Since patients are not permitted to opt for higher quality accommodations, surroundings, or care when there is no private comprehensive system to provide such services, the public health care system will not need to consider offering them (Boucher and Palda, 1996).

Private supplementary health care can exist in many forms; it need not take the form it does in the United States where private health insurers provide reimbursement for all health care, including emergency care. A comprehensive supplementary system may exist as it does in Norway, where a number of private clinics have appeared to provide surgeries such as open heart surgery, hip surgery, and mi-

nor surgeries such as arthroscopy, cataracts, sterilization, and varicose vein surgery (Van de Noord et al., 1998) that are subject to long or detrimental waiting lists in the public system. A system like that found in the United Kingdom may also be a solution: there the private system covers ambulatory surgeries and care for all who are privately insured and provides an option for those who face long queues for treatment in the public system. There is also the possibility of private providers taking over the relatively common, less invasive, and simpler procedures from the public sector for paying customers, thus allowing the public providers and public health care system to provide the more difficult and more costly care. For example, private hospitals provide more in terms of ancillary services in New Zealand, while the best high-tech care is most often available in the publicly run facilities (French et al., 2001).

A competitive private sector, working alongside the public sector, can also serve as a measure of quality and availability of health services in the public sector, as well as competition with the public sector for patient care. If patient care in the public sector were to deteriorate sufficiently, patients would begin switching to private care in order to attain the best treatment in the timeliest manner. As patients moved to the private pay sector, conditions would not only improve for those in the public sector as patient loads fell but the public sector would also find itself in the precarious position of falling out of favour with the public and losing its funding from public sources as care shifted towards the private sector. This would have the effect of creating an incentive to improve the quality and quantity of treatment, especially in a system where funding was patient-based, since, as patients switched to private providers, public providers would see their revenues fall immediately.

Answer: No, Canada's approach is not copied by any other country.

Only two countries of the 28 surveyed in table 11 have no comprehensive private provision of care: Canada, and the Czech Republic. Interestingly, Canada is the only country to have full public management of hospital resources and no private parallel insurance system. Canada is also the only country to outlaw private parallel health care. In each of the other 26 countries, a fully private sector exists to provide care to those willing to pay. In some countries, this fully private sector exists by design, as all individuals are covered by, or have the choice to be covered by, some private insurance scheme. In other countries, this private sector exists to allow patients a way to attain expedited health care when faced with long waiting lists, as is the case for patients in Norway. Finally, in countries such as Germany and the Netherlands, a private insurance sector exists to provide health care to those wealthy enough to leave the mandatory social insurance system that serves the entire population below a given income threshold.

Table 11: Private Insurers and Private Care in the OECD

	Private Comprehensive Care[1]	Description of Private Insurance
Australia	Yes	Members of private health insurance funds can insure against the costs of treatment and accommodations as private patients in hospitals. Primary medical care by doctors is not covered by private insurance (including co-payments) although dental and optical services as well as non-physician health care and prescribed medicines not covered by the public scheme are included. The private insurance industry is heavily regulated: for example, insurers must accept all applicants and must have community rated fees and benefit packages. Private insurance purchase is subsidized publicly.
Austria	Yes	Private supplementary insurance is available to obtain treatment by a doctor of the patients' own choice, reduce the waiting times for diagnostic services, and cover outpatient medical treatments, which covers both home visits and surgeries as well as the costs of drugs, etc. Private for-profit insurance companies provide coverage.
Belgium	Yes	Risk-based private insurance is offered by private for-profit companies.
Canada	**No**	**Private insurance covers items not explicitly offered by the public scheme. Patients are otherwise forbidden from seeking private care in Canada, even through the use of out-of-pocket payments to receive expedited care.**

Table 11 continued: Private Insurers and Private Care in the OECD

	Private Comprehensive Care[1]	Description of Private Insurance
Czech Republic	No	Currently, voluntary insurance includes coverage for health care when traveling abroad, for foreign nationals not eligible for coverage under the compulsory health insurance system, and for certain services not provided under the state system.
Denmark	Yes	Voluntary health insurance, in addition to covering patient fees and commodities, offers coverage for treatment at private hospitals.
Finland	Yes	Voluntary insurance has a very small market in Finland, however insurance may be purchased for care in private hospitals.
France	Yes	Private care is available by paying private providers out-of-pocket.
Germany	Yes[2]	A portion of the population (former public scheme members who have surpassed the mandatory enrollment income threshold, many self-employed, and some public employees) can purchase full private insurance. Otherwise, the mandatory system is composed of competitive insurance schemes, and patients can choose among insurers.
Greece	Yes	Private insurance schemes are available for those seeking care from private providers. Unofficial payments are also known to be used for the receipt of better quality or expedited care.
Hungary	Yes	For-profit insurance is extremely limited although some companies offer comprehensive insurance at the upper end of the market. Typically, expedited care or higher quality care is attainted through informal payments to providers.
Iceland	Yes	Patients may seek care from private specialists and general practitioners. Few Icelandic patients have private insurance.
Ireland	Yes	Private insurance is available to those who wish to receive care in private hospitals or in public hospitals that cater to private patents.
Italy	Yes	Private insurance in Italy is mainly provided as a substitute for services supplied by the NHS. Approximately 60% of insurance companies in Italy are for-profit, while 40% are not-for-profit. Patients can also make direct payments to private providers.
Japan	Yes[2]	The Japanese health system is characterized by over 5,000 social insurers with free choice among competitive health providers.
Korea	Yes[2]	Private cash-benefits insurance policies are available to provide financial support in the event of an insuree developing certain chronic diseases. Though there is only one insurer in Korea, patients are free to select among competitive providers for service and the national insurer does not directly enforce the volume or intensity of medical services consumed. Patients may also pay additional fees above those reimbursed for care or pay directly out of pocket.
Luxembourg	Yes	Generally, private insurers in Luxembourg offer supplementary insurance to cover services that are not classified as necessary or useful. Private insurance does exist but has only developed to a limited extent. German health insurance funds have also entered the market and begun to offer insurance for treatment in Germany for non-severe medical conditions.
Netherlands	Yes	Approximately 40% of the population (high-income earners) are free to purchase their own private insurance plan for all health care services except those covered under the Exceptional Medical Expenses Act (long-term hospitalizations, home care, expensive drug therapies, etc.).
New Zealand	Yes	New Zealander's purchase private insurance to avoid long waiting times for non-emergent surgery and to cover user charges for primary care visits. Private insurance does not cover emergent care.
Norway	Yes	Patients may visit private health care centres in urban centres in Norway, or pay out-of-pocket to visit private specialists who do not receive public funding.
Poland	Yes	Patients may pay for private health care services out of pocket. In addition, "envelope payments" may be made to public providers for superior or expedited service. New legislation has provided for the possibility of private insurance schemes from 2002.

Table 11 continued: Private Insurers and Private Care in the OECD

	Private Comprehensive Care[1]	Description of Private Insurance
Portugal	Yes	Private health insurance, mostly group insurance by employers, is available to cover care in private provider settings.
Slovak Republic	Yes	Patients may receive care on a fee-for-service basis from local private outpatient clinics.
Spain	Yes	Two types of private insurance are available. The first is a supplementary insurance scheme directed towards services that are not offered by the National Health System. The second is a scheme that provides an alternative to the NHS. Patients may also pay directly for private outpatient and inpatient care.
Sweden	Yes	Private insurance is available to Swedish citizens, although it is usually provided to high-level employees. This insurance provides immediate non-emergent care at private hospitals.
Switzerland	Yes[2]	The Swiss insurance scheme consists of mainly private not-for-profit insurers, who offer a basic package of benefits to individuals with varying deductibles. Supplementary insurance is also available on either a for-profit or not-for-profit basis, the most popular of which offer free choice of doctor and cover for superior inpatient accommodation. Individuals are free to select among a number of insurers in their region.
Turkey	Yes	Insurance schemes vary from comprehensive coverage to coverage for higher quality services in the public sector.
United Kingdom	Yes	Private insurance coverage is available to individuals who wish to receive non-emergent care in private hospitals. In 1996, 10.8% of the population had private insurance coverage.

(1) The availability of comprehensive benefits is considered whether or not an actual separate insurance scheme, additional to the standard national scheme (where applicable) exists. These benefits need not be available to the entire population. This would mean that a country such as Poland, where no official private health care insurance exists but where patients may receive expedited care or specialized care without concern for publicly administered controls from a practitioner for a fee would be considered as having comprehensive benefits available privately.
(2) This system is considered to provide comprehensive benefits through a private scheme principally on the basis that all insurance coverage is on a public or private not-for-profit basis where patients may choose among competitive care providers. In the Czech Republic, The Netherlands, Switzerland, and Germany, patients may also choose among insurers.

Sources: See Appendix A

Is the Canadian model of funding health care primarily from general tax revenues widely followed? What are the consequences of this system?

Three ways to pay

In a universal-access health care system or a mandatory social insurance system,[16] there are three ways to finance health care. The first is to finance the health care system through general tax revenue, where the health care system is allocated a budget that is paid from general tax revenue by any of local, regional, sub-national, and national governments. The second method is to have a designated tax, where collections can be made by any level of government but monies paid are deposited into a separate account which is to be used exclusively for health care and where no outside funding sources are collected into the account, and no other costs are paid from the account. The third method of financing a mandatory or public health care system is to have a social insurance scheme where social insurers collect funds directly from enrollees, which are then used to pay for the services provided by the insurer. There is also the possibility of blending methods of finance, as is done in many countries where the majority of finance is derived from one method while a second method is used to cover any deficits incurred by the health insurance scheme, and to pay for the poor, elderly, and unemployed.

General tax revenue

Each insurance scheme has its advantages. Using general taxation to finance the health care system can reduce the administrative costs of collection and payment, as providers and consumers both must deal with only one insurer. The disadvantages to funding health care from general taxation include a lack of transparency, as there is no easily established link between the payment into, and the benefits received from, health care. This means that an increase in the tax rate that is claimed to be for health services can be far larger in revenue terms than any increase in funding to health care. Also, a system with general tax financing and no cost sharing—i.e., care that appears "free" to the consumer, such as in Canada where health care is entirely financed through general taxation[17]—can lead to what Pauly (1968) described as an "inconsistency," where individuals demand health care as though it were free, and yet consider the positive costs of that care when voting over changes in tax rates. In other words, general tax financing can potentially lead to chronic shortages in health care financing.

Dedicated tax

The use of a dedicated tax has the advantage of being more transparent, since monies paid in are more directly related to those paid out. Dedicated tax financing results in greater accountability, since increases in tax revenue cannot be as easily justified for one purpose while actual spending is undertaken elsewhere—an outcome more easily accomplished with a general tax financing regime where revenues are pooled prior to expenditure. The disadvantage to dedicated tax financing is much the same as that of general tax financing, that it is still ultimately a tax, and thus subject to politically motivated intervention and voters' valuations. There is still the issue of a lack of transparency in taxation; although a dedicated tax is an improvement from general tax financing, it still falls short of a social insurance system.

Social insurance

The final system, social insurance financing, uses a system of either public or private insurers (or some mix thereof) to provide health care to citizens once they are enrolled with an insurer. Although some tax financing may still be required to provide coverage by an insurer for the poor, the unemployed, and the elderly, this system is less likely to suffer from politically motivated intervention than a fully tax financed system, as independent bodies collect the insurance payments and disperse the funds for health services. In addition, allowing users the choice of insurer, as the Czech Republic, Germany, the Netherlands, and

Switzerland do, has the added benefit of creating competition among insurers and generating efficiencies in the health care system as a result of competition (for sources, see Appendix A).

Dedicated tax financing and social insurance financing can also have risk-adjusted premiums that account for personal behaviour and choices that may result in higher future expenditures. Behaviour such as smoking, heavy alcohol consumption, and a disregard for one's personal well being (e.g., a lack of exercise) can be adjusted into these premiums in order that patients who will demand more health services pay more for coverage.[18] Such an adjustment is not possible with general tax financing.

In deciding which of these systems is the superior form of financing, it is interesting to note that beyond concerns about accountability and administration, those countries that have opted for a social insurance system of finance appear to have fewer problems with the promptness of care than those who have chosen a primarily tax-financed system (Altenstetter and Björkman, 1997).

How do other OECD countries pay?

Table 12 gives data on 27 OECD countries and their primary financing regime for public health care. Each country's primary financing regime is described with a letter, either "G" for general tax financing, "D" for dedicated tax financing, or "S" for social insurance financing. Countries with a financing system other than general tax revenue have a letter in the second column that describes the financing system for those who cannot afford to pay from their own income without detriment to their well-being.

Of 27 countries, 13 use general tax financing for their public health care systems. Of the remaining 14, 12 countries use a social insurance financing regime, one has a dedicated health care tax, and one combines both social insurance based finance and general tax financing for the provision of health care services. For secondary financing, 13 of the 14 health systems in the OECD not financed by general taxes provide coverage for those who cannot afford to pay through general tax sources. The fourteenth country, Germany, requires that the unemployed and the retired have their contributions made up by the unemployment and retirement funds respectively.

Adopting the social insurance model in Canada would offer greater transparency and provide the opportunity for competition in insurance supply, while potentially reducing waiting times and maintaining the same protections for the unfortunate as presently exist.

Answer: Regrettably, international comparison does not enable us to choose between the greater transparency of a segregated social insurance program or general taxation funding since half of the OECD countries use general taxation and half use segregated taxation or a social insurance agency.

Table 12: Principal Methods of Financing Public Health Insurance in the OECD

	Principal Type	Financing for those unable to pay
Australia	G	
Austria	S	G
Belgium	S	G
Canada	**G**	
Czech Republic	S	G
Denmark	G	
Finland	G	
France	S	G
Germany	S	S[1]
Greece	G, S[2]	G
Hungary	D	G
Iceland	G	
Italy	G	
Japan	S	G
Korea	S	G
Luxembourg	S	G
Netherlands	S	G
New Zealand	G	
Norway	G	
Poland	G	
Portugal	G	
Slovak Republic	S	G
Spain	G	
Sweden	G	
Switzerland	S	G
Turkey	S	G
United Kingdom	G	

Type: S = Social Insurance Scheme / Mandatory Insurance Scheme
D = Dedicated Tax
G = General Taxation

(1) A small proportion of the German population (police officers, soldiers, etc.) is covered by free, tax-financed governmental health care (2% of the population). Farmers' insurance funds also receive a tax-subsidy to compensate for the gap between elderly farmers' incomes and actual expenditure.
(2) Health services for all citizens in Greece are financed both through general tax based sources and social insurance premiums.

Sources: See Appendix A

How does Canada's access to high-tech medicine compare to that of other countries?

The basics[19]

Modern medicine is highly dependent upon scientific advances, such as the development of new drugs. Indeed, much of the increase in life expectancy that has occurred in the past century is the result of vaccines, antibiotics, and other drugs that have controlled and, in some cases, even eradicated diseases that previously afflicted humans. In addition to the benefits of new drugs, in recent years a significant portion of the advance in medical science has been the result of medical technology.

Measuring the effect of technology on health care outcomes is difficult. In particular, it is often a challenge to distinguish improvements that stem from advancements in technology from those that are the result of simple changes that are not technologically oriented. For example, in recent years, perinatal mortality has decreased in most of the technologically advanced countries. There is a temptation to believe that this is primarily a result of advances in technology. The reality is that this reduction in death stems mainly from simple improvements in social and preventive factors (Swyer, 1993). Better nutrition, avoiding alcohol, weight control, monitoring blood pressure, and the promotion of similar measures appear to account for most of the improvements. Similarly for adults, recent changes encouraging post-operative patients to become mobile much sooner after surgery have resulted in reduced morbidity and mortality. These are simple, non-technological, changes that stem from an improved understanding of disease.

Nevertheless, technology has also been shown to be important in improving basic health outcomes. Modern emergency departments and operating rooms are supported by an array of equipment much of which was unavailable as recently as ten years ago and which permit operative and diagnostic procedures that were previously thought impossible.

The beneficial effects of improvements in technology are reflected in two recent papers. Hunink et al. (1997) estimated that 43% of the decline in mortality due to coronary artery disease between 1980 and 1990 was the result of acute treatments, including "high" (sophisticated) and "low" (simple) technologies. Braunwald (1997) concluded that both low-tech and high-tech innovations contributed to improved cardiac outcomes in the 1980s and 1990s.

Reduced incidence of coronary artery disease may be due to a variety of factors but an accurate diagnosis depends upon sophisticated new radiological and nuclear-medicine scanning techniques. Indeed, the potential for treatment depends upon more advanced investigation using scanning equipment not available only a few years ago.

A cardiovascular surgeon performing an operation, an anaesthetist administering anaesthetic to a patient, or an intensivist whose task it is to ensure the survival of a patient during the post-operative period in intensive care, may all make effective use of new technologies. Where such technology is unavailable, people who are otherwise operable may be rejected for treatment because of the operative risk or surgical outcomes than could have been achieved had the technology, such as cardiac catheterization, been available.

Coronary artery disease is but one example of illnesses that often require very sophisticated, up-to-date, equipment to obtain an optimum therapeutic result. Individuals suffering from advanced kidney disease, those in need of surgery to the brain, people with treatable cancer, and victims of motor-vehicle accidents are all potential beneficiaries of technology. Without appropriate technology, there are increases in patient suffering, illness, and death.

Shortages of technology impede exact diagnoses and inhibit high-quality treatment. However, there is an additional dimension to this problem: even when a particular technology is available, all too often it is outdated. Out-dated equipment is subject to frequent breakdown and, even when operational, often has slower performance and poorer quality results than an up-to-date version. Unfortu-

nately, comparable data on this topic is difficult to come by and thus is not discussed here. However, the pace at which technology is adopted determines the average "vintage" of the machines in use. Therefore, countries that adopt technology more slowly can, in general, be presumed also to use machines that are, on average, older than in countries with rapid adoption.

Whether Canada—or any country— possesses the appropriate amount and mix of medical technology is one of the most important, and perplexing, questions currently facing health policy-makers. Indeed, despite the enormous attention paid to various technological advances in health care, systematic knowledge—in medicine and in economics—regarding the benefits and costs associated with these technologies is relatively limited. This relative ignorance stems, in part, from the vastness and fluidity of medical technology. For one, technology can refer not only to machinery and devices but also to pharmaceutical and surgical innovations. As well, in each of these areas, there is a multitude of specific treatment innovations corresponding to a substantial array of diseases and conditions. Finally, technology by its very nature is dynamic: evaluations of today's new technologies rapidly become obsolete along with the underlying technologies or, more subtly, with changes in the evaluation environment (e.g., costs of other medical resources).

Despite (or because of) these intrinsic difficulties, identifying and applying what we do know is vital. It has been noted that Canada is slower to take up many technologies, especially in cardiac care, than the United States (TECH, 2001), but is Canada slow to take up technology when compared to other developed nations with more similar "social welfare" approaches to health care provision? Since many of these countries have a larger proportion of the population over the age of 65 than does Canada, it is likely best to consider technology with some adjustment for the age of the population. Like health expenditures, where the elderly consume far more resources than other proportions of the population, medical technologies are likely to be used at a higher rate as the population ages. Since there are no documented studies of increased use of medical technologies as the population ages, it seems most logical to apply the same proportional increase in spending to the adjustment of machinery—from box 2 above, this means that $(\rho + 1)$ is now multiplied by the number of machines instead of the health expenditures—since increased use of medical technologies is likely to rise roughly proportionally to increased use of all health services. Understanding the number of machines available to the population with an adjustment for increased use by older populations can aid us in understanding whether the long waiting times in Canada are a result of policies on cost sharing and private provision, or part of a greater problem including a lack of investment.

Answer: Canada ranks poorly on most measures of access to high-tech care.

Table 13 provides information on the age-adjusted availability of selected health care technologies in OECD countries (the unadjusted ratios of technology to population are given in appendix B). With this information, it is possible to see just how many MRI machines, CT scanners, lithotriptors, and radiation therapy machines are available in each country and how that number compares to the other countries of the OECD.

The first striking insight that can be gleaned from table 13 is that the number of machines available per million inhabitants in Canada is clearly less than the OECD average in three of the four categories. Only in one of the categories does Canada have more machines per population than the OECD average. This means that Canada has fewer MRI machines per million inhabitants, fewer CT-Scanners per million inhabitants and fewer lithotriptor machines per million inhabitants than the OECD *average.* As the table shows, the technology deficit relative to other high-spending countries, such as Germany, Iceland, and Switzerland, is even greater.

For MRI machine availability, Canada ranks a depressing fifteenth in a comparison of 24 OECD countries. For computed tomography scanner availability, Canada ranks a disappointing seventeenth out of 23 OECD countries. Worse still, for lithotriptor availability, Canada ties for last of 15 OECD countries. The only upside to this is the ranking for the availability of radiation therapy machines, where Canada ranked eighth out of 22 OECD countries. It is clear that the Canadian health care system does not provide a level of health technology commensurate with its relatively high spending. It is also interesting to note that the diffusion of MRI machines over time (the rate at which they are acquired) has been much less rapid in Canada than in other OECD countries (Harriman et al., 1999), implying that Canada also has older and less effective MRI machines and lacks widespread access to open magnet and more sophisticated, special purpose, scanners.

Given these levels of access to high-tech health care, it is not surprising that a wait of nearly three months exists for an MRI scan in Canada, or a waiting time of greater than one month for a CT scan (Esmail and Walker, 2003).

Table 13: Age-Adjusted Availability of Medical Technology in the OECD, 2001

	MRI / Million	Rank out of 24	CT Scanner / Million	Rank out of 23	Radiation Therapy Machines / Million	Rank out of 22	Lithotriptors / Million	Rank out of 15
Australia	5.2	11	—	—	5.7	11	1.8	7
Austria	11.1	5	25.2	4	4.4	16	1.7	8
Belgium	2.9	17	—	—	5.8	10	—	—
Canada	**3.9**	**15**	**10.5**	**17**	**7.8**	**8**	**0.4**	**14**
Czech Republic	2.0	20	11.8	14	10.4	5	3.0	5
Denmark	6.5	9	13.1	10	5.3	13	—	—
Finland	10.7	6	13.4	9	15.0	2	0.4	14
France	2.4	19	8.9	20	5.7	11	0.9	12
Germany	5.6	10	15.5	8	4.2	17	1.5	10
Greece	1.8	21	12.3	12	3.7	18	4.2	2
Hungary	1.5	23	5.1	22	—	—	—	—
Iceland	16.5	2	20.6	5	16.5	1	4.1	3
Italy	7.4	7	18.7	6	3.2	20	—	—
Japan	20.3	1	73.7	1	—	—	—	—
Korea	11.2	4	44.8	2	7.9	7	7.9	1
Luxembourg	4.6	13	25.6	3	4.6	14	2.4	6
Netherlands	—	—	—	—	7.6	9	—	—
New Zealand	3.0	16	12.3	12	11.3	4	—	—
Poland	0.4	24	0.4	23	—	—	—	—
Portugal	2.6	18	11.2	16	2.7	21	1.1	11
Slovak Republic	1.6	22	10.2	18	13.0	3	—	—
Spain	5.1	12	11.3	15	3.4	19	1.6	9
Sweden	7.1	8	12.7	11	—	—	—	—
Switzerland	12.4	3	16.9	7	9.3	6	3.9	4
Turkey[1]	—	—	10.0	19	1.8	22	0.9	12
United Kingdom	4.3	14	5.8	21	4.6	14	—	—
OECD Average	6.3	—	17.0	—	7.0	—	2.4	—

(1) Figures for Turkey were not age adjusted due to remarkably low dependency ratios that were not conducive to meaningful adjustment.
Nota bene: data for the year 2001 was not available for all countries. Earlier years have been substituted where noted below.
MRI 2000 Data: Australia, Denmark, France, and Hungary.
MRI 1999 Data: Japan, Sweden, and United Kingdom.
MRI 1998 Data: Greece and New Zealand.
MRI 1997 Data: Belgium, Germany, Poland, and Portugal.
CT Scanner 2000 Data: France and Hungary.
CT Scanner 1999 Data: Japan, Sweden, and United Kingdom.
CT Scanner 1997 Data: Germany, Greece, Poland, and Portugal.
Radiation Therapy 2000 Data: France and New Zealand.
Radiation Therapy 1999 Data: Greece.
Radiation Therapy 1997 Data: Belgium, Canada, Germany, Netherlands, and Portugal.
Lithotriptor 2000 Data: Australia and France.
Lithotriptor 1999 Data: Greece.
Lithotriptor 1997 Data: Germany and Portugal.

Source: OECD 2003; calculations by authors (see Box 2 in the section on health care expenditures above).

Canada spends more on health care than any other universal access country. Do we get our money's worth?

The fundamental purpose of a health sector in an economy is not to generate new technologies or earn profits but rather to provide health services for the population's benefit. This aspect of health services is the principal reason for much of the study in the field and the heated debate about the characteristics of health systems from all sides. Unfortunately, though there is a great body of literature on the economic aspects of health service provision and on the fairness of Marxist principles in health care provision (from each according to ability, to each according to need), there is little work on the actual ability of health care systems to provide quality care for patients and the population in general.

In attempting to determine whether health care services are being provided at a level commensurate with the amount of money spent or commensurate with the level of quality that the current resistance to change would suggest in Canada (lower levels of quality would likely result in a desire for change), it is important, as suggested by Reinhard Busse (2002), to divide the examination of the quality of health services into two parts. The first part should deal with the actual patient experience in terms of waiting times for surgeries and satisfaction with the health care system or health care services. This first group of measures must be subjective by nature, as there are often expectations of quality of care and personal impressions about health care that cannot be modeled accurately in an objective manner. A second more objective set of measures, measures that are related to more than just the health care system (Busse, 2002), is a consideration of the ability of the health care system to provide healthy longevity, low levels of mortality from disease, and effective treatment for terminal illnesses. In other words, this second set of measures is designed to measure health outcomes. Unfortunately, these measures, though more readily available and more objective than the first, do not measure only the effects of the health care system. Though a well functioning health care system might provide the crucial component in the result, health outcomes will ultimately be determined as a result of several processes, of which the health care system is only one (Busse, 2002). The first set of measures, though not as easily available or readily comparable from study to study, are less likely to be affected by external sources unrelated to the health care system.

The first set of measures—health system performance

Information on this first set of measures is often difficult to come by and studies cannot be readily compared due to the variability of questions and survey designs. However, one recent survey can be used to compare the health system in Canada with those of other nations. Also, several international studies on health care wait lists are available that can be used to compare waiting times for medical procedures in a number of countries.

Blendon et al. (2002), in a survey of five countries, found that Canadians were more likely to experience waiting times of over 4 months for non-emergency surgery than Australians, New Zealanders, or Americans, but less likely than patients in the United Kingdom. Patients in Canada were also most likely to wait more than one month for surgery, though there was only a small difference between Canada and the United Kingdom (table 14). In the same survey, for measures of perceived quality of care, Canadians were least likely to report the overall care experience as excellent when compared to the other four countries but were equally ready to rate it as good, fair, or poor (table 14). For access to specialist visitations, Canadians surveyed were almost as likely as survey respondents in the United States to state that it was either very or extremely difficult to see a specialist. A greater proportion of survey respondents in Canada than patients in the other universal access countries surveyed found it very, or extremely, difficult to see a specialist. Canadians were also least likely to state

Table 14: Consumers reporting on access to care, waiting for care, and overall experience with health care

	Australia	Canada	New Zealand	United Kingdom	United States
Access—difficulties seeing a specialist when needed					
Very or extemely difficult	12%	16%	11%	13%	17%
Somewhat difficult	23%	28%	23%	22%	22%
Not too or not at all difficult	60%	51%	61%	53%	59%
Waiting times for non-emergency surgery (own or that of a family member)					
Less than one month	51%	37%	43%	38%	63%
One to 3.9 months	26%	36%	31%	24%	32%
Four months or more	23%	27%	26%	38%	5%
Overall medical care—percent who said that medical care (own or that of a family member) received in past 12 months was:					
Excellent	26%	20%	27%	21%	22%
Very good	37%	34%	40%	32%	35%
Good	26%	32%	23%	30%	28%
Fair	8%	9%	6%	13%	10%
Poor	2%	3%	2%	2%	3%

Source: Blendon et al., 2002.

that it was either not too difficult or not at all difficult to see a specialist (Blendon et al., 2002).

The results from this survey quite clearly suggest that there are problems related to access in the health care system in Canada and that these problems are more significant than those found in any of Australia, New Zealand, the United Kingdom, or the United States. Canadian patients surveyed were the second most likely to have experienced waiting times longer than 4 months for surgery, the most likely to have not received surgery in under one month, the second most likely to find access to specialists extremely difficult, and the least likely to rate the overall health system experience as excellent in comparison with survey respondents from the other four countries.

Further confirmation of the magnitude of Canadian waiting times can be derived from five international comparative studies. Coyte et al. (1994) found that in the late 1980s, Canadians waited longer than Americans for orthopaedic consultation (5.4 versus 3.2 weeks) and for surgery post-consultation (13.5 versus 4.5 weeks). Collins-Nakai et al. (1992) discovered that in 1990, Canadians waited longer than Germans and Americans, respectively, for cardiac catheterization (2.2 months versus 1.7 months versus 0 months), angioplasty (11 weeks versus 7 weeks versus 0 weeks), and bypass surgery (5.5 months versus 4.4 months versus 0 months). Another study of cardiac procedures by Carroll et al. (1995), revealed that in 1992 Canadians generally waited longer for both elective and urgent coronary artery bypass than did Americans (whether in private or public Veterans' Administration hospitals) and Swedes, and longer than Americans (in either hospital type) for either elective or urgent angiography. At the same time, Canadians had shorter waits than the British for elective and urgent bypasses and angiographies, and shorter waits than Swedes for both types of angiographies. Finally, Jackson, Doogue, and Elliott (1998) compared the waiting time for coronary artery bypass between New Zealand in 1994/1995 and Ontario in the same period, using data from Naylor et al. (1995). They found that the New Zealand mean and median waiting times (232 and 106 days, respectively) were longer than the Canadian mean and median (34 and 17 days, respectively).

The problems with access to care are also not uniform among the socioeconomic groups in Canada. Though the health system in Canada is often defended as one that treats all equally, there was a notable difference in the ratings of care among economic groups. Those with below-average income in Canada were 9% less likely to rate care as excellent or very good, and 6% more likely to rate care as fair or poor in a survey of citizens in five countries (Blendon et al., 2002). Those with below-average incomes in Canada were also more likely than those with above-average incomes not to visit a doctor as a result of cost concerns, and were more likely to have difficulty seeing a specialist (Blendon et al., 2002). Government provision of care in Canada has clearly not meant equal care for all.

The second set of measures—health outcomes[20]

Health of the population is a function of many inputs, not just health care services. Life expectancy does not result directly from extra health care spending or better hospital services. However, longer life spans would not be as likely without these services. In other words, health care is just one of many inputs into the well being of a population. There are, however, some measures that can be used to gauge more directly the ability of a health system to enhance the longevity and health of a population.

Life expectancy and disability-adjusted life expectancy (DALE)

The first of these measures is known as disability-adjusted life expectancy (DALE), which determines how long individuals in a country will live without disability. This measure, calculated in the World Health Report 2000 (WHO, 2000), can be compared with life expectancy to determine the number of years lost to disability or the percentage of expected lifetime that individuals can expect to live without a major disability. This measure may allow some insight into the ability of the health care system to provide care for individuals who may soon face severe illnesses that will have a significantly negative effect on their standard of living.

Table 15 gives life expectancy and DALE information for 26 OECD countries and ranks them based on the percentage of life expectancy that is estimated to be possible without disability. Not surprisingly, most Western European countries do fairly well in this comparison, with a few exceptions. At fourteenth, Canada ranks better than almost half of the countries in this category. However, it is notable that none of the countries that have higher proportions of

Table 15: Life Expectancies in the OECD, 1999

	Disability Adjusted Life Expectancy (DALE)	Life Expectancy (LE)	DALE/LE (%)	Rank
France	73.1	78.8	92.8%	1
Australia	73.2	79.0	92.7%	2
United Kingdom	71.7	77.4	92.6%	3
Spain	72.8	78.6	92.6%	3
Japan	74.5	80.5	92.5%	5
Netherlands	72.0	77.9	92.4%	6
Belgium	71.6	77.6	92.3%	7
Italy	72.7	79.0	92.0%	8
Sweden	73.0	79.5	91.8%	9
Austria	71.6	78.1	91.7%	10
Portugal	69.3	75.7	91.5%	11
Norway	71.7	78.4	91.5%	11
Luxembourg	71.1	77.9	91.3%	13
Canada	**72.0**	**79.0**	**91.1%**	**14**
Slovak Republic	66.6	73.1	91.1%	14
Finland	70.5	77.4	91.1%	14
Poland	66.2	72.7	91.1%	14
Ireland	69.6	76.5	91.0%	18
Switzerland	72.5	79.7	91.0%	18
Czech Republic	68.0	74.8	90.9%	20
Germany	70.4	77.7	90.6%	21
Denmark	69.4	76.6	90.6%	21
Hungary	64.1	70.8	90.5%	23
Iceland	70.8	79.6	88.9%	24
New Zealand	69.2	78.3	88.4%	25
Korea	65.0	75.5	86.1%	26

Source: WHO, 2000 and OECD, 2003.

total life expectancy without disability spend a smaller proportion of their GDPs on health care either prior to, or after, age-adjustment for spending.

Infant and perinatal mortality rates

The diametric opposite of measures of the length of life and the proportion of that lifetime that can be enjoyed without disability are measures of mortality. The most basic measures of mortality commonly used to compare health status are infant and perinatal mortality rates. Though these mortality statistics can be affected by immigration from poor countries, unhealthy outlier populations, and other population demographics (Seeman, 2003), they can also serve as indicators of a well-functioning health care system.

Recent work from the OECD on the relationship between health care resources and health outcomes makes the most pertinent case for inclusion of these statistics as measures of health system performance. Zeynep Or (2001) found that OECD countries with more doctors perform better on both infant and perinatal mortality statistics: a 10% increase in the ratio of physicians to population can lead to a 6% to 6.5% reduction in both rates. Further, Or notes that these mortality statistics are a useful measure of health system performance, since "the performance of a health system is often judged by its capacity to prevent deaths at the youngest ages" (Or, 2001). He also notes that perinatal mortality is an important indicator of "effectiveness of health care interventions during pregnancy and childbirth" (Or, 2001).

Tables 16 and 17 below compare the infant and perinatal mortality rates in Canada to those in other OECD nations. For infant mortality, measured as the number of deaths under one year per 1,000 live births, Canada performs fairly poorly, ranking sixteenth out of 28 OECD countries. For perinatal mortality, the number of deaths under seven days plus fetal deaths of 28 weeks gestation or more per 1,000 total births, Canada performs a somewhat better twelfth out of 26 countries ranked. In both cases, all of the countries that out-perform Canada manage to do so without outlawing private health care for the population and most do so with a cost-sharing regime in place. Finally, only one country in each case did not spend less on health care than Canada after age adjustment.

Equally interesting is the change in rank that has occurred over the five-year period leading up to these measurements. In 1996, Canada ranked twelfth of 28 countries in infant mortality and twelfth of 26 countries in perinatal mortality. In the five years since (from 1995 to 2000 for Canada due to the unavailability of data from 2001), Canada has managed to reduce the infant mortality rate by 11.7% and the perinatal mortality rate by 11.6%, compared to OECD averages of 15.5% and 10.5%. In other words, though Canada out-performed the OECD average on reductions in perinatal mortality (ranking thirteenth), Canada under-performed in reductions of infant mortality (ranking sixteenth).

Though many of the countries that managed large reductions in their mortality rates started with fairly high rates (primarily the Eastern European countries), there were notable reductions in infant mortality in countries such as Italy (30.6%), Spain (29.1%), and Finland (20.0%); and notable reductions in perinatal mortality in Iceland (37.8%), Italy (24.7%), and Japan (16.3%).

Table 16: Infant mortality in the OECD, 2001

	Infant Mortality Rate	Rank
Iceland	2.7	1
Japan	3.1	2
Finland	3.2	3
Sweden	3.7	4
Norway	3.8	5
Spain	3.9	6
Czech Republic	4.0	7
Italy	4.3	8
Germany	4.5	9
France	4.6	10
Austria	4.8	11
Denmark	4.9	12
Switzerland (2000)	4.9	12
Belgium	5.0	14
Portugal	5.0	14
Australia	5.3	16
Canada (2000)	**5.3**	**16**
Netherlands	5.3	16
United Kingdom	5.5	19
Ireland	5.8	20
New Zealand (1999)	5.8	20
Greece	5.9	22
Luxembourg	5.9	22
Korea (1999)	6.2	24
Slovak Republic	6.2	24
Poland	7.7	26
Hungary	8.1	27
Turkey	38.7	28

Source: OECD, 2003.

Table 17: Perinatal Mortality in the OECD, 2001

	Perinatal Mortality Rate	Rank
Japan	3.6	1
Czech Republic	4.3	2
Finland	4.3	2
Iceland	4.6	4
Korea (1999)	5.2	5
Portugal	5.6	6
Spain (1999)	5.7	7
Sweden	5.7	7
Australia (2000)	5.8	9
Italy (2000)	5.8	9
Norway (2000)	5.9	11
Canada (2000)	**6.1**	**12**
Austria	6.2	13
Germany (1999)	6.2	13
New Zealand (1999)	6.2	13
Switzerland (2000)	6.6	16
France (2000)	6.7	17
United Kingdom	6.7	17
Belgium (1999)	7.1	19
Slovak Republic	7.2	20
Luxembourg (2000)	7.3	21
Netherlands	7.9	22
Poland	8.1	23
Ireland (2000)	9.0	24
Greece (1999)	9.1	25
Hungary	9.5	26

Source: OECD, 2003.

Mortality from disease and mortality amenable to health care

Unfortunately, the use of DALE, LE, and infant and perinatal mortality as measures of the effectiveness of a health system includes a number of effects that are not related to the health system. Measures such as crime rates, pollution, water quality, and public sanitation systems enter into the effects of life expectancy in addition to those directly related to the health care systems that have been compared in this report. A second set of measures that focus on the causes of life expectancy can be used to estimate the ability of the health care system to reduce the burden of mortality from a specific subset of health conditions. This focus on health-related deaths is likely to give better insight into the performance of the health care system by removing many external effects on longevity that are included in DALE, LE, and infant and perinatal mortality. In other words, the comparison of mortality from disease and the following comparison of potential years of life lost due to disease are more likely to measure the effects of the health system than simpler measures of life expectancy.

The OECD (2003) provides data on the number of age-standardized deaths per 100,000 population for selected causes. The causes selected for comparison here, as defined by the OECD (2003) according to The Ninth Revision of the International Classification of Diseases are:

- infectious and parasitic diseases;
- malignant neoplasms;
- endocrine, nutritional, and metabolic diseases and immunity disorders;
- diseases of blood and blood forming organs;
- diseases of nervous system and sense organs;
- diseases of circulatory system;
- diseases of respiratory system;
- diseases of the digestive system;
- diseases of genitourinary system;
- complications of pregnancy, childbirth, and the puerperium;
- diseases of the skin and subcutaneous tissue;
- diseases of the musculoskeletal system and connective tissue;
- congenital anomalies;
- certain conditions originating in the perinatal period.

Although the estimates of mortality can be completed using all effects on health, it seems most insightful to remove the effects of accidental causes (such as motor vehicle accidents and homicides) and focus on a set of illnesses from which mortality is more likely to be the result of ineffective health care. For this reason, the comparison does not include external sources of injury and poisoning, death from symptoms and poorly defined conditions, and mental disorders.

The results of summing the causes of death listed above are shown in table 18, where countries are ranked by the inverse of mortality. Countries with lower levels of mortality are ranked higher than those with higher levels of mortality. In this comparison, Canada has the ninth lowest number of deaths by cause of the 27 OECD countries ranked. Of the countries that out-performed Canada on this ranking, all have some form of cost sharing for health services, allow some form of private comprehensive insurance or care, and all but one spend less on health care (age adjusted) than Canada does.

A finer way of breaking down mortality is to use a measure known as mortality amenable to health care; a measure first developed in the 1970s (Rutstein et al., 1976). This approach follows from the knowledge that much of

Table 18: Mortality in the OECD, 1999

	Mortality Rate[1]	Rank
Japan	438.9	1
Switzerland	476.7	2
France	480.5	3
Australia	504.2	4
Sweden	513.6	5
Korea	525.0	6
Italy	528.8	7
Iceland	536.3	8
Canada (1998)	**541.2**	**9**
Spain	544.1	10
Norway	552.0	11
Greece	554.8	12
Luxembourg	556.2	13
New Zealand (1998)	561.7	14
Finland	567.2	15
Netherlands	583.6	16
Austria	586.5	17
Germany	593.4	18
Belgium (1996)	605.3	19
Denmark (1998)	628.5	20
United Kingdom	639.8	21
Portugal	681.5	22
Ireland	739.1	23
Poland	779.0	24
Czech Republic	802.3	25
Slovak Republic	886.7	26
Hungary	892.6	27

(1) Standardized death rates from all causes not external or poorly defined, per 100,000 population.

Source: OECD, 2003

what determines an individual's health comes from outside the health care system itself, which means that most common measures of health outcomes do not explicitly measure the quality of health services (Nolte and McKee, 2003). The measure of mortality amenable to health care was developed out of a search for tools that would specifically allow measurement of the effects of improvements in medical care and uses mortality data related to conditions that should be preventable through appropriate medical interventions (Rutstein et al., 1976).

Nolte and McKee (2003) have recently published information comparing a number of OECD countries on this measure using detailed statistics on causes of death published by the World Health Organisation. Nolte and McKee also made one additional specific subdivision of mortality data beyond identifying specific causes of death: the age at which death occurred. In many cases, only childhood deaths were considered, since deaths at older ages were suspected of resulting from another medical process. In addition, other illnesses were capped at higher age limits in order to accommodate evidence relating to the effectiveness or potential ineffectiveness of modern medicines in dealing with these conditions at more advanced ages. An age limit of 75 years was used for most other statistics (Nolte and McKee, 2003). The causes of death and age ranges considered by Nolte and McKee are shown in table 19.

As this breakdown relies on more detailed information on the causes of death than that used to develop aggregate mortality statistics above, only 18 countries are compared in table 20.[21] This comparison of health system performance also includes 50% of the mortality from ischaemic heart disease (IHD), though Nolte and McKee were unsure whether or not it should be included. Since the relationship between health services and reductions in mortality from IHD has not been confirmed, Nolte and McKee felt that comparisons with and without the statistic should be presented. They also note, however, that there is growing evidence showing that up to half of premature mortality from IHD may be linked to the effectiveness of health services (Nolte and McKee, 2003). In addition to this growing evidence on the links between health services and IHD, the OECD has noted that the health care policies in countries can create variations in treatment patterns for IHD and access to technologies and pharmaceuticals for IHD patients. It is for these two latter reasons that the comparison including IHD mortality is presented here.

In this comparison, Canada has the eighth lowest mortality rate of the 18 OECD countries ranked. Though the Canadian health care system appears to perform relatively well in this breakdown of mortality amenable to health care, there are seven health systems that manage to do better. Each of these seven countries spends less on health care (age adjusted) than Canada does and allows some form of private comprehensive insurance or care. Only Spain does not have some form of cost sharing for health services.

Potential years of life lost (PYLL)

Both simple and more complex rankings of countries by the number of deaths caused by disease do have one significant shortfall: they do not expressly account for the health system's ability to prevent death at very young ages. The third measure of mortality compared, potential years of life lost (PYLL), provides an explicit way of weighting deaths occurring at younger ages, where conditions are *a priori* prevent-

Table 19: Causes of death considered amenable to health care.

Cause of Death	Age Range
Intestinal infections	0–14
Tuberculosis	0–74
Other infections (diphtheria, tetanus, poliomyelitis)	0–74
Whooping cough	0–14
Septicaemia	0–74
Measles	1–14
Malignant neoplasm of colon and rectum	0–74
Malignant neoplasm of skin	0–74
Malignant neoplasm of breast	0–74
Malignant neoplasm of cervix and uteri	0–74
Malignant neoplasm of cervix uteri and body of uterus	0–44
Malignant neoplasm of testes	0–74
Hodgkin's disease	0–74
Leukaemia	0–44
Diseases of the thyroid	0–74
Diabetes mellitus	0–49
Epilepsy	0–74
Chronic rheumatic heart disease	0–74
Hypertensive disease	0–74
Cerebrovascular disease	0–74
All respiratory diseases (excl. pneumonia and influenza)	1–14
Influenza	0–74
Pneumonia	0–74
Peptic ulcer	0–74
Appendicitis	0–74
Abdominal Hernia	0–74
Cholelithiasis and cholecystitis	0–74
Nephritis and nephrosis	0–74
Benign prostatic hyperplasia	0–74
Maternal death	All
Congenital cardiovascular anomalies	0–74
Perinatal deaths, all causes, excluding stillbirths	All
Misadventures to patients during surgical or medical care	All
Ischaemic heart disease (50%)	0–74

Source: Nolte and McKee, 2003

Table 20: Mortality Amenable to Health Care, 1998

	Mortality per 100,000	Rank
France	75.08	1
Sweden	79.60	2
Japan	81.41	3
Spain	84.11	4
Norway	87.51	5
Italy	88.13	6
Australia	88.36	7
Canada (1997)	**91.80**	**8**
Germany	95.90	9
Denmark	97.21	10
Netherlands	97.26	11
Greece	98.53	12
Austria	106.85	13
New Zealand	109.03	14
Finland	109.64	15
Ireland	129.34	16
Portugal	132.07	17
United Kingdom	133.62	18

Source: Nolte and McKee, 2003

able (OECD, 2002). This measure is calculated by adding deaths occurring at each age in the categories listed above and multiplying those deaths by the number of years to live (until the age limit of 70). The PYLL measure from the OECD (2003) is standardized for population age profiles.

Table 21 gives the PYLL measure for 27 OECD countries in 1999. Not surprisingly, most of the countries in the top ten on simple measures of mortality from disease have remained in the top ten when weighting for premature mortality. Two of the countries in the top ten, Spain and Korea, managed to drop noticeably in the rankings once the weighting was done, suggesting that many of the deaths numerated in table 18 were of younger members of the population. Again, even when premature mortality is accounted for, the countries that fare better than Canada all have some form of cost sharing, all allow some form of private care or insurance, and all but one spend less on health care (age-adjusted) than Canada does.

Mortality from cancer

Two final comparisons on health system performance can be found in a comparison of cancer incidence and mortality rates in the OECD. Using data from the GLOBOCAN 2000 database (Ferlay et al., 2001), it is possible to determine the estimated number of deaths that would occur as a result of breast cancer and colorectal cancer in 2000 as a proportion of the number of the estimated new cases that would occur in that year. This data is useful in estimating the proportion of patients who will survive a bout with these cancers in a given country. In other words, this estimate can provide an estimate of the proportion of patients who are likely to be cured from a disease, which is often considered a basic measure of the effectiveness of health care practices (Berrino et al., 1999).

Table 21: Potential Years of Life Lost in the OECD, 1999

	Potential Years of Life Lost (PYLL)1	Rank
Sweden	2,041	1
Iceland	2,059	2
Japan	2,119	3
Switzerland	2,131	4
Norway	2,260	5
Luxembourg	2,336	6
Australia	2,375	7
Finland	2,460	8
Canada (1998)	**2,526**	**9**
Italy	2,539	10
France	2,555	11
Austria	2,633	12
Netherlands	2,671	13
Germany	2,679	14
New Zealand (1998)	2,745	15
Spain	2,757	16
Greece	2,797	17
Belgium (1996)	2,863	18
Denmark (1998)	2,883	19
United Kingdom	2,973	20
Ireland	3,029	21
Korea	3,049	22
Czech Republic	3,576	23
Portugal	3,716	24
Poland	4,347	25
Slovak Republic	4,778	26
Hungary	6,288	27

[1] Standardized death rates from all causes not external or ill defined, per 100,000 population.

Source: OECD, 2003

Ratios for estimated mortality from breast cancer in 2000 to estimated incidence of breast cancer in 2000, using age-standardized ratios to eliminate any bias from older populations, are given in table 22. Although these summary statistics do not measure the true underlying chances of surviving breast cancer in a given country, they can be used as comparative measures to give a rough approximation of the underlying efficiency of the health system in identifying and treating this disease. After adjusting spending for age structure, all five countries that out-perform Canada spend less on health care as a percentage of GDP. As before, all the countries that fare better than Canada on this measure have some form of cost sharing and some form of parallel private health care provision for the population.

Yet another comparison of cancer treatment outcomes can be made for cancer of the colon and rectum. This type of cancer is a major cause of both mortality and morbidity in western countries for those over the age of 50, and is second only to lung cancer as one of the most common forms of cancer in the developed world (Semmens and Platell, 2001; Farrands and Britton, 1984; Ferlay et al., 2000). The likelihood of surviving colorectal cancer is highly dependent on early detection and treatment of the disease. This is confirmed by medical research, which indicates that the five-year survival rate of patients with early tumors can be better than 90%, while those with tumors that have spread substantially falls below 50% (Farrands and Britton, 1984; Lefall, 1981).

Due to the link between medical intervention and survival rates from colorectal cancer, the ratio of mortality to incidence of the disease within a country can be used as a rough measure of the general effectiveness of that country's health care system. Ratios for estimated mortality from colorectal cancer in 2000 relative to estimated incidence in 2000, using age-standardized ratios to eliminate any bias from older populations, are given in table 23. Again, as in the case of breast cancer above, these ratios do not measure the true underlying chances of surviving a bout with colorectal cancer but do give a rough approximation of the comparative underlying efficiency of the health system. This data indicates that Canada performs remarkably well on this measure, placing first in mortality from colorectal cancer.

Answer: Although the top spender, Canada ranks eighth, ninth, sixth, and first in comparisons of mortality that are closely related to the performance of a health system. Canada's cumulative rank is fifth, behind Sweden, Japan, Australia, and France.

Table 22: Incidence and Mortality (per 100,000) from Breast Cancer in the OECD, 2000

	Incidence[1]	Mortality[1]	Ratio	Rank
Sweden	81.0	17.5	21.6%	1
Finland	78.4	17.9	22.8%	2
Australia	82.7	19.7	23.8%	3
Japan	31.4	7.7	24.5%	4
France	83.2	21.4	25.7%	5
Canada	**81.8**	**22.7**	**27.8%**	**6**
Norway	68.5	20.7	30.2%	7
Netherlands	91.6	27.8	30.3%	8
New Zealand	82.6	25.9	31.4%	9
Italy	64.9	20.7	31.9%	10
Korea	12.5	4.0	32.0%	11
Belgium	82.2	26.4	32.1%	12
Germany	73.6	23.7	32.2%	13
Portugal	55.3	18.4	33.3%	14
Luxembourg	69.3	23.2	33.5%	15
Denmark	86.2	29.2	33.9%	16
Austria	67.2	23.3	34.7%	17
Greece	47.6	16.7	35.1%	18
United Kingdom	74.9	26.8	35.8%	19
Switzerland	70.1	25.2	35.9%	20
Ireland	71.6	25.8	36.0%	21
Poland	46.6	16.8	36.1%	22
Hungary	67.2	25.3	37.6%	23
Spain	47.9	18.1	37.8%	24
Czech Republic	54.1	21.0	38.8%	25
Slovak Republic	45.6	18.4	40.4%	26
Turkey	20.4	9.2	45.1%	27
Iceland	70.2	36.8	52.4%	28

(1) Incidence and mortality rates are in age-standardized form, per 100,000 population, and include cancer incidence and mortality at all ages.

Sources: Ferlay et al., 2001; calculations by authors.

Table 23: Incidence and Mortality among Women (per 100,000) from Colorectal Cancer in the OECD, 2000

	Female Incidence	Female Mortality	Male Incidence	Male Mortality	Average Mortality Ratio (Male and Female)	Rank
Canada	**29.8**	**11.6**	**40.7**	**16.4**	**39.6%**	**1**
Australia	35.4	14.4	49.8	20.1	40.5%	2
Japan	25.3	11.0	43.2	17.6	42.1%	3
Sweden	24.6	11.5	33.0	14.4	45.2%	4
France	26.8	12.1	39.8	18.3	45.6%	5
Netherlands	30.4	14.0	41.6	19.0	45.9%	6
Portugal	24.3	11.3	40.6	18.5	46.0%	7
New Zealand	43.4	20.2	55.3	25.7	46.5%	8
Italy	24.0	11.3	35.3	16.4	46.8%	9
Finland	21.2	9.5	25.2	12.5	47.2%	10
Greece	13.6	6.7	17.3	8.4	48.9%	11
Luxembourg	30.9	14.8	37.3	19.5	50.1%	12
Belgium	28.0	14.4	37.3	18.2	50.1%	12
Germany	31.9	17.0	45.0	21.7	50.8%	14
Iceland	20.7	13.1	29.9	12.2	52.0%	15
Switzerland	23.8	11.6	31.7	17.7	52.3%	16
Ireland	28.7	15.4	44.2	22.6	52.4%	17
Spain	21.0	11.1	32.0	17.3	53.5%	18
United Kingdom	25.3	13.8	35.4	18.7	53.7%	19
Norway	33.8	18.0	40.0	22.0	54.1%	20
Austria	26.1	14.9	43.2	23.0	55.2%	21
Poland	19.7	11.6	30.0	16.6	57.1%	22
Korea	10.3	5.7	14.9	8.8	57.2%	23
Czech Republic	31.5	18.5	60.3	34.2	57.7%	24
Slovak Republic	26.5	16.1	50.6	28.0	58.0%	25
Hungary	34.6	20.9	59.8	33.5	58.2%	26
Denmark	30.5	18.5	38.8	23.8	61.0%	27
Turkey	5.3	3.4	9.1	5.9	64.5%	28

(1) Incidence and mortality rates are in age-standardized form, per 100,000 population, and include cancer incidence and mortality at all ages.

Sources: Ferlay et al., 2001; calculations by authors.

Conclusion

This study has attempted to provide answers to a series of questions that are important to resolve if Canada is to make the correct choices as it amends its health care policies. The study is strictly comparative and examines a wide number of factors for the member countries of the OECD in arriving at the answers to the questions posed.

Taking this empirical approach to health care provides clear direction for health care reform in Canada.

- Canada and Iceland have the most expensive health care systems amongst the industrialized nations that have comprehensive, universal access to health care.
- Canada ranks first in only one of seven health care outcome categories and does not rank first in any of access to care, supply of technologies, or supply of physicians.
- No country in the industrialized world other than Canada outlaws a parallel private health care system for their citizens.
- All four countries that out-perform Canada on the cumulative rank for mortality amenable to health care, potential years of life lost, mortality from breast cancer, and mortality from colorectal cancer have private health care alternatives to the public system and some form of user fees at the point of access; none spends more than Canada after age adjustment.

The comparative evidence is that the Canadian health care model is inferior to others in place in the OECD. It produces inferior access to physicians and technology, produces longer waiting times, is less successful in preventing death from preventable causes, and costs more than any of the other systems that have comparable objectives. The models that produce superior results and cost less than Canada's monopolistic, single-insurer, single-provider system have user fees; alternative, comprehensive, private insurance; and private hospitals. Canada should follow the example of these superior health care models.

Notes

1 For the purposes of this study, Mexico and the United States are not included for comparison as the health care systems in these countries do not incorporate universal access to care. Thus, the OECD is defined here as all OECD countries except Mexico and the United States.

2 The age adjustments below are not calculated for Turkey due to remarkably low dependency ratios that were not conducive to meaningful adjustment.

3 This calculation relies on the assumption that private health spending would grow at the same rate as public health spending, as the OECD has estimated only public health spending growth.

4 The following discussions on the basics of health care, welfare loss, co-insurance and co-payments, cost shifting, empirical evidence on cost sharing, and the RAND Health Insurance Experiment are primarily based on, and borrow from, Ramsay, 1998.

5 In the insurance market, this is known as the law of large numbers. Roughly, the law of large numbers states that random movements of a large number of individual items tend to offset one another. For more details on the law of large numbers, see Lipsey and Steiner, 1978: 21.

6 It has been argued that many theoretical analyses avoid distributional issues and assume a single-person economy. For example, Arrow (1963) made such an assumption when he demonstrated that deductibles and co-insurance can be welfare enhancing. Years later, Arrow relaxed this assumption and used a model with a very large population but assumed that each member of the population was identical in order to bypass distributional considerations. Evans (1993) notes that no one, with the exception of Arrow, has pointed out the limitations of such restrictive assumptions. Evans argues that models based on these restrictive assumptions do not, and cannot, help us analyze the welfare effects of cost sharing.

7 The level of health insurance coverage in the United States at that time was much lower than it is today, suggesting that the welfare loss of over-insurance in the United States today may be even greater.

8 These "sick poor" are the most disadvantaged but make up only a small proportion (6%) of the population studied.

9 In most of the current debate about hospitals, those opposed to privatization imply that hospitals are a special type of organization that is not subject to the usual economic incentives. There is little reason to believe this is so.

10 Although Canadian hospitals are legally considered private, not-for-profit entities (Standing Senate Committee, 2002), they are governed largely by a political process, given wage schedules for staff, are told when investment can be undertaken, denied the ability to borrow privately for investment, and told which investments will be funded for operation, and thus are considered public hospitals for the sake of comparability.

11 The following discussion on private-sector and public-sector businesses is primarily based on, and borrows from, Clemens and Esmail, 2002a, 2002b.

12 The following discussion on private versus public hospitals is primarily based on, and borrows from, Zelder, 1999.

13 The following discussion on supplier-induced demand is primarily based on, and borrows from, Ramsay, 1998.

14 These results suggest that a 100% increase in surgeons—a doubling of the number of surgeons—would only increase the total number of surgeries by 9%.

15 To justify this conclusion, Rice and Labelle cite Barer, Evans, and Labelle, 1985, 1988; Barer and Evans, 1986; and several studies that have been reviewed in Gabel and Rice, 1985, but are not cited in Feldman and Sloan, 1988.

16 Though these two may seem equivalent, in that both are mandated by government and require that the entire

population be covered for health services, they are far different in terms of the required design of the health care system, the opportunities for private insurers and providers, and the resultant opportunities for competition.

17 Although British Columbia and Alberta have a specific health care tax, these contributions are paid into a common pool along with all other general tax revenues from which all provincial spending is financed.

18 One caution to the application of risk-adjusted premiums is that they should not be adjusted in a public scheme for pre-existing conditions or family historical risk of heart conditions or cancers. These conditions are part of the reason that public or mandatory health insurance schemes exist and, thus, should not be accounted for based on the simple principles of fairness to those who are "unlucky" enough to face such a condition.

19 This discussion on health technology is based on, and borrows from, Harriman et al., 1999.

20 In seeking to understand the link between the structure of a health system and its effectiveness in dealing with disease, it is important to bear in mind the following. Some health systems may accomplish better general access to primary care, thus achieving higher rates of early detection for disease among their populations. However, early detection may also be influenced by the level of diagnostic knowledge and training for primary care physicians like GPs, access to diagnostic procedures, or the effectiveness of available diagnostic technology. Survival rates may also be independently affected by the quality of treatment procedures once the disease is discovered. Therefore, ratios of mortality to incidence and general mortality statistics are only an approximation of the *aggregate* effectiveness of the health system as a whole and do not explain which part of the system contributes more or less to survival rates from diseases that are sensitive to medical intervention. This means that some health systems may be better at some aspects of the diagnosis and treatment of certain diseases among the population as a whole and still achieve the same survival outcomes as systems structured differently. The limitations of currently available data are that we simply do not know what it is about any particular health system that might be contributing to lower or higher mortality rates relative to other health care systems.

21 According to the methodology employed by Nolte and McKee, only larger countries with high quality mortality data for years more recent than 1996 were included. Newer data were not available for Belgium and Switzerland, while Luxembourg and Iceland were considered too small for inclusion. In addition, data for the United States calculated by Nolte and McKee is not included in *How Good is Canadian Health Care?* as the American health care system does not incorporate universal access to care.

Appendix A: Sources for policy comparison tables

Australia: Hilless and Healy (2001).
Austria: Hofmarcher and Rack (2001).
Belgium: European Observatory (2000a).
Canada: European Observatory (1996a); Flood (2000); and Altenstetter et al. (1997).
Czech Republic: European Observatory (2000b).
Denmark: Vallgårda et al. (2001).
Finland: Järvelin (2002).
France: Imai et al. (2000); and Poullier and Sandier (2000).
Germany: European Observatory (2000c); Tuffs (2004); and Busse (2002).
Hungary: European Observatory (1999a); and Orosz and Burns (2000).
Iceland: World Health Organization Regional Office for Europe and European Commission (2000); and Ovretveit (2001).
Ireland: World Health Organization Regional Office for Europe and European Commission (1998).
Italy: Donatini et al. (2001).
Japan: Jeong et al. (2001) and Imai (2002).
Korea: Colombo et al. (2003), and Moise et al. (2003).
Luxembourg: European Observatory (1999b).
Netherlands: World Health Organization Regional Office for Europe and European Commission (1997b); Flood (2000); and Dixon and Mossialos (2001).
New Zealand: Flood (2000).
Norway: European Observatory (2000d); and Van den Noord et al. (1998).
Poland: European Observatory (1999c); and Girouard (2000).
Portugal: European Observatory (1999d).
Slovakia: European Observatory (2000e); and Slovak Republic Ministry of Health (2003).
Spain: European Observatory (2000f).
Sweden: Hjortsberg and Ghatnekar (2001); Swedish Institute (1999); European Union Online (2002); and Lofgren (2002).
Switzerland: European Observatory (2000g); OECD (2000); and Colombo (2001).
United Kingdom: Busse (2002); Dixon (2001); and European Observatory (1999e).

Appendix B: Unadjusted ratios of physicians and technology to population

Table B1: Comparison of Doctors per 1,000 Population for Select OECD Countries

Rank of 23	Country	2001	Rank of 23	Country	2001
1	**Austria**	3.3	13	**Luxembourg**	2.6
1	**France**	3.3	14	**Australia**	2.5
1	**Germany**	3.3	14	**Switzerland**	2.5
4	**Finland**	3.1	16	**United Kingdom**	2.2
4	**Belgium (1998)**	3.1	**17**	**Canada**	**2.1**
6	**Czech Republic (2000)**	3.0	18	**Poland**	2.0
6	**Norway**	3.0	19	**Slovak Republic**	1.9
8	**Denmark**	2.9	20	**Spain (1998)**	1.8
8	**Greece**	2.9	21	**New Zealand (2000)**	1.5
8	**Hungary**	2.9	22	**Netherlands**	1.3
11	**Portugal**	2.8	22	**Turkey**	1.3
12	**Sweden (2000)**	2.7			

Source: OECD, 2003.

Table B2: Medical Technology in the OECD, 2001

	MRI / Million	Rank out of 24	CT Scanner / Million	Rank out of 23	Radiation Therapy Machines / Million	Rank out of 22	Lithotriptors / Million	Rank out of 15
Australia	4.7	12	—	—	5.1	12	1.6	10
Austria	11.6	4	26.3	3	4.6	15	1.8	7
Belgium	3.2	16	—	—	6.4	9	—	—
Canada	**3.5**	**15**	**9.5**	**19**	**7.0**	**8**	**0.4**	**14**
Czech Republic	1.9	21	11.4	15	10.0	4	2.9	5
Denmark	6.6	9	13.2	12	5.4	11	—	—
Finland	11.0	5	13.7	11	15.4	1	0.4	14
France	2.6	18	9.6	18	6.1	10	1.0	12
Germany	6.2	10	17.1	8	4.6	15	1.7	9
Greece	2.0	20	13.8	10	4.2	18	4.7	2
Hungary	1.5	22	5.3	22	—	—	—	—
Iceland	14.0	2	17.5	7	14.0	2	3.5	4
Italy	8.6	6	21.9	5	3.8	19	—	—
Japan	23.2	1	84.4	1	—	—	—	—
Korea	6.8	8	27.3	2	4.8	14	4.8	1
Luxembourg	4.5	14	24.9	4	4.5	17	2.3	6
Netherlands	—	—	—	—	7.2	7	—	—
New Zealand	2.6	18	10.6	16	9.8	5	—	—
Poland	0.4	24	0.4	23	—	—	—	—
Portugal	2.8	17	12.1	14	2.9	21	1.2	11
Slovak Republic	1.3	23	8.5	20	10.9	3	—	—
Spain	5.7	11	12.5	13	3.8	19	1.8	7
Sweden	7.9	7	14.2	9	—	—	—	—
Switzerland	12.9	3	17.6	6	9.7	6	4.1	3
Turkey	—	—	10.0	17	1.8	22	0.9	13
United Kingdom	4.6	13	6.2	21	4.9	13	—	—
OECD Average	6.3	—	16.9	—	6.7	—	2.2	—

Note: Data for the year 2001 was not available for all countries. Earlier years have been substituted where noted in table 13.
Source: OECD 2003.

References

Altenstetter, Christa, and James Warner Björkman, eds. (1997). *Health Policy Reform, National Variations, and Globalization.* London: MacMillan Press Ltd.

Antel, John J., Robert L. Ohsfeldt, and Edmund R. Becker (1995). "State regulation and hospital costs." *The Review of Economics and Statistics* 77, 3: 416–22.

Arrow, Kenneth J. (1963). "Uncertainty and the welfare of medical care." *American Economic Review* 53: 941–73.

Barer, Morris, and Robert Evans (1986). "Riding north on a south-bound horse? Expenditures, prices, utilization and incomes in the Canadian health care system." In R. Evans and G. Stoddart (eds.), *Medicare at Maturity: Achievements, Lessons and Challenges* (Calgary: University of Calgary Press): 53–163.

Barer, Morris, Robert Evans, and R. Labelle (1985). *The Frozen North: Controlling Physician Costs through Controlling Fees: The Canadian Experience.* Washington, DC: Office of Technology Assessment.

——— (1988). *Direct Charges to Patients: Snare or Delusion?* Toronto: Ontario Economic Council.

Barlow, Maude (2002). *Profit Is Not the Cure.* Ottawa: Council of Canadians.

Beck, R.G., and J.M. Horne (1980). "Utilization of publicly insured health services in Saskatchewan, during and after copayment." *Medical Care* 18, 8 (August): 787–806.

Beito, David T. (2001). "From mutual aid to welfare state: How fraternal societies fought poverty and taught character." *Fraser Forum* (December): 4–8.

Berrino, F., R. Capocaccia, J. Estève, G. Gatta, T. Hakulinen, M. Sant, and A. Verdecchia, eds. (1999). *Survival of Cancer Patients in Europe: The EUROCARE-2 Study.* France: International Agency for Research on Cancer.

Blendon, Robert J., Cathy Schoen, Catherine M. DesRoches, Robin Osborn, Kimberly L. Scoles, and Kinga Zapert (2002). "Inequities in health care: A five-country survey." *Health Affairs* 21, 3: 182–91.

Blevins, Sue A. (2001). *Medicare's Midlife Crisis.* Washington, DC: Cato Institute.

Bloom, Abby L., ed. (2000). *Health Reform in Australia and New Zealand.* New York: Oxford University Press.

Boaz, David (1999). "Charity and mutual aid." *Fraser Forum* (June): 4–6.

Bolin, T.D. (1996). "Cost benefit of early diagnosis of colorectal cancer." *Scandinavian Journal of Gastroenterology Supplement* 220: 142–46.

Boucher, Michel, and Filip Palda (1996). "Who are we? How health care is mired in the canadian sense of community." *Fraser Forum* (July): 15–17.

Braunwald, Eugene (1997). "Cardiovascular medicine at the turn of the millennium: Triumphs, concerns, and opportunities (Shattuck Lecture)." *New England Journal of Medicine* 337, 19: 1360–69.

Busse, Reinhard (2002). *The British and the German Health Care Systems.* Developed for the Anglo-German Foundation. <http://www.agf.org.uk>.

Butler, Eamonn, ed. (1992). *Privatization in the Nineties.* London: Adam Smith Institute.

Canadian Institute for Health Information [CIHI] (2002). *Health Care in Canada.* CIHI: Ottawa.

——— (2003). *National Health Expenditure Trends, 1975–2003.* CIHI: Ottawa.

Carroll, R.J., et al. (1995). "International comparison of waiting times for selected cardiovascular procedures." *Journal of the American College of Cardiology* (March 1): 557–63.

Cawley, John, and Tomas Philipson (1999). "An empirical examination of information barriers to trade in insurance." *American Economic Review* 89: 827–46.

Clarkson, Kenneth (1972). "Some implications of property rights in hospital management." *Journal of Law and Economics* 15: 363–84.

Clemens, Jason, and Nadeem Esmail (2002a). "Crown corporations part I: We're still debating this?" *Fraser Forum* (May): 20–22.

——— (2002b). "Crown corporations part II: Where to from here?" *Fraser Forum* (June): 19–22.

Cleverley, William O., and Roger K. Harvey (1992). "Is there a link between hospital profit and quality?" *Health Care Financial Management* September 46, 9: 40, 42, 44–45.

Collins-Nakai, R.L., H.A. Huysmans, and H.E. Skully (1992). "Task force 5: Access to cardiovascular care: An international comparison." *Journal of the American College of Cardiology* 19: 1477–85.

Colombo, Francesca (2001). *Towards More Choice in Social Protection? Individual Choice of Insurer in Basic Mandatory Health Insurance in Switzerland*. Labour Market and Social Policy—Occasional Papers 53. Paris: OECD.

Colombo, Francesca, Jeremy Hurst, Yutaka Imai, Peter Scherer, and Hyoung-Sun Jeong (2003). *OECD Reviews of Health Care Systems: Korea.* <http://www.oecd.org>.

Coyte, P.C., et al. (1994). "Waiting times for knee replacement surgery in the United States and Ontario." *The New England Journal of Medicine* 331, 16 (October0): 1068–71.

Cromwell, J., and J.B. Mitchell (1986). "Physician induced demand for surgery." *Journal of Health Economics* 18: 407–24.

Currie, Gillian, Cam Donaldson, and Mingshan Lu (2003). "What does Canada profit from the for-profit debate on health care?" *Canadian Public Policy* 29, 2: 227–35.

Cutler, David M. (1995). "The cost and financing of health care." *The American Economic Review* 85, 2: 32–37.

Dang, Thai Than, Pablo Antolin, and Howard Oxley (2001). *Fiscal Implications of Ageing: Projections of Age-Related Spending*. Economics Department Working Papers 305. Paris: OECD.

Department of Health (Ireland) (1994). Ireland's Report to the WHO Regional Office for Europe on the 1994 Health for All Monitoring Exercise (unpublished).

Devereaux, P.J. et al. (2002). "A systematic review and meta-analysis of studies comparing mortality rates of private for-profit and private not-for-profit hospitals." *Canadian Medical Association Journal* 166, 11: 1399–406.

Devlin, Nancy, Alan Maynard, and Nicholas Mays (2002). "New Zealand's new health sector reforms: Back to the future?" *British Medical Journal* 322: 1171–74.

Diderichsen, Finn (2000). "Sweden." *Journal of Health Politics, Policy and Law* 25, 5: 931–35.

Dixon, Anna, and Elias Mossialos (2001). "Funding health care in Europe: recent experiences." In T. Harrison and J. Appleby (eds.), *Health Care UK* (London: King's Fund): 66–77.

Dixon, Jennifer (2001). "Transforming the NHS: what chance for the new government?" *Journal of the Institute of Economic Affairs* 21, 4: 4–8.

Donatini, Andrea, Ana Rico, Maria Giuseppina D'Ambrosio, Alessandra Lo Scalzo, Letizia Orzella, Americo Cicchetti, and Silvia Profili (2001). *Health Care Systems in Transition: Italy.* Denmark: European Observatory on Health Care Systems.

Doorslaer, Eddy van, and Frederik T. Schut (2000). "Belgium and the Netherlands revisited." *Journal of Health Politics, Policy and Law* 25, 5: 875–87.

Ellis, Randall P., and Thomas G. McGuire (1993). "Supply-side and demand-side cost sharing in health care." *The Journal of Economic Perspectives* 7, 4: 135–51.

Esmail, Nadeem (2001). "Canada's abysmal health technology record." *Fraser Forum* (November): 24–26.

——— (2002a). "Labour costs in the hospital sector revisited." *Fraser Forum* (January): 31–32.

——— (2002b). "When does more doctors mean less access?" *Fraser Forum* (April): 3, 6.

——— (2003). "Spend *and* wait?" *Fraser Forum* (March): 25–26.

European Observatory on Health Care Systems (1996a). *Health Care Systems in Transition: Canada.* Denmark: European Observatory on Health Care Systems.

——— (1996b). *Health Care Systems in Transition: Greece.* Denmark: European Observatory on Health Care Systems.

——— (1996c). *Health Care Systems in Transition: Turkey.* Denmark: European Observatory on Health Care Systems.

——— (1999a). *Health Care Systems in Transition: Hungary.* Denmark: European Observatory on Health Care Systems.

——— (1999b). *Health Care Systems in Transition: Luxembourg.* Denmark: European Observatory on Health Care Systems.

——— (1999c). *Health Care Systems in Transition: Poland.* Denmark: European Observatory on Health Care Systems.

——— (1999d). *Health Care Systems in Transition: Portugal.* Denmark: European Observatory on Health Care Systems.

——— (1999e). *Health Care Systems in Transition: United Kingdom.* Denmark: European Observatory on Health Care Systems.
——— (2000a). *Health Care Systems in Transition: Belgium.* Denmark: European Observatory on Health Care Systems.
——— (2000b). *Health Care Systems in Transition: Czech Republic.* Denmark: European Observatory on Health Care Systems.
——— (2000c). *Health Care Systems in Transition: Germany.* Denmark: European Observatory on Health Care Systems.
——— (2000d). *Health Care Systems in Transition: Norway.* Denmark: European Observatory on Health Care Systems.
——— (2000e). *Health Care Systems in Transition: Slovakia.* Denmark: European Observatory on Health Care Systems.
——— (2000f). *Health Care Systems in Transition: Spain.* Denmark: European Observatory on Health Care Systems.
——— (2000g). *Health Care Systems in Transition: Switzerland.* Denmark: European Observatory on Health Care Systems.
European Union Online (2002). *Sweden: Health Care.* <http://europa.eu.int/comm/employment_social/missoc2001/sv_part2_en.htm>.
Evans, Robert G. (1984). *Strained Mercy. The Economics of Canadian Health Care.* Butterworths: Toronto.
——— (1993). *User Fees for Health Care: Why a Bad Idea Keeps Coming Back*. HPRU 93: 9D. Vancouver, BC: Health Policy Research Unit, Centre for Health Services and Policy Research, University of British Columbia.
——— (2000). "Canada." *Journal of Health Politics, Policy and Law* 25, 5: 889–97.
Farrands, P.A., and D.C. Britton (1984). "Intervention in large bowel carcinogenesis—does screening improve prognosis?" *Scandinavian Journal of Gastroenterology Supplement* 104: 151–59.
Federal Ministry of Health, Germany (2001). *Health Care in Germany including the Health Care Reform 2000.* <http://www.bmgesundheit.de/engl/healthcare.htm>.
Feldman, Roger, and Frank Sloan (1988). "Competition among physicians: Revisited." *Journal of Health Politics, Policy and Law* 13, 2: 239–61.
——— (1989). "Reply from Feldman and Sloan." *Journal of Health Politics, Policy and Law* 14, 3: 621–25.
Feldman, Roger, Frank Sloan, and Lynn Paringer (1981). "Compensation arrangements between hospitals and physicians." *The Bell Journal of Economics* 12, 1: 155–70.
Feldstein, Martin (1973). "The welfare loss of excess health insurance." *The Journal of Political Economy* 81: 251–80.
Feldstein, Martin, and Jonathan Gruber (1994). *A Major Risk Approach to Health Insurance Reform.* NBER Working Paper 4852. Cambridge, MA: National Bureau of Economic Research.
Ferguson, Brian S. (1994). *Physician Supply Behaviour and Supplier Induced Demand.* Working Paper 84-08. Queen's University /University of Ottawa Economics Projects Study of Cost Effectiveness of the Canadian Health Care System.
——— (2002). *Profits and the Hospital Sector: What Does the Literature Really Say?* Halifax, NS: Atlantic Institute for Market Studies. <http://www.aims.ca/commentary/profits.pdf>.
Ferguson, B., and A. Crawford (1989). "Supplier-induced demand: a disequilibrium test." *Applied Economics* 21: 597–609.
Ferlay, J., F. Bray, P. Pisani and D.M. Parkin (2001). *GLOBOCAN 2000: Cancer Incidence, Mortality and Prevalence Worldwide, Version 1.0*. IARC CancerBase No. 5. Lyon: IARCPress.
Flood, Colleen M. (2000). *International Health Care Reform: A Legal, Economic, and Political Analysis*. New York: Routledge.
Folland, Sherman, Allen C. Goodman, and Miron Stano (2001). *The Economics of Health and Health Care.* 3rd edition. Upper Saddle River, NJ: Prentice Hall.
Folland, S., and M. Stano (1989). "Sources of small area variation in the use of medical care." *Journal of Health Economics* 8: 85–107.
French, Sian, Andrew Old, and Judith Healy (2001). *Health Care Systems in Transition: New Zealand.* Denmark: European Observatory on Health Care Systems.
Fuchs, V.R. (1978). "The supply of surgeons and the demand for operations." *Journal of Human Resources.* Supplement.
Fuchs, V.R., and M. Kramer (1972). *Determinants of Expenditure for Physicians' Services in the United States, 1948–68.* New York, NY: National Bureau of Economic Research.
Gabel, J.H., and T.H. Rice (1985). "Reducing public expenditures for physicians' services: the price of paying less." *Journal of Health Politics, Policy and Law* 9: 595–609.
Gage, Heather (2001). "NHS malaise: diagnosis and treatment options." *Journal of the Institute of Economic Affairs* 21, 4 (December): 9–13.
Girouard, Nathalie, and Yutaka Imai (2000). "The healthcare system in Poland." Economics Department Working Papers 257. Paris: OECD.

Gosden, T., et al. (2001). "Impact of payment method on behaviour of primary care physicians: a systematic review." *Journal of Health Services Policy* 6: 44–55.

Government of Finland (2001). *European Social Charter: The Sixth Periodic Report.* <http://formin.finland.fi/doc/fin/ihmisoik/social.html>.

Graham, John R. (2002). "Dead capital on Ontario's hospitals." *Fraser Forum (*April): 23–24.

Gratzer, David, and Neil Seeman (2002). "Private medicine kills?" *National Post* (May 31): A17.

Grenon, André (2001). *Health Expenditure in Canada by Age and Sex: 1980-81 to 2000-01.* Ottawa: Health Canada. <http://www.hc-sc.gc.ca/english/care/ expenditures/exp_age_sex.html>.

Gruber, Jonathan, and Aaron Yelowitz (1999). "Public health insurance and private savings." *The Journal of Political Economy* 107, 6: 1249–74.

Ham, Chris, ed. (1997). *Health Care Reform: Learning from International Experience.* Philadelphia, PA: Open University Press.

Harriman, David, William McArthur, and Martin Zelder, with Jared Alexander (1999). *The Availability of Medical Technology in Canada: An International Comparative Study.* Public Policy Sources 28. Vancouver, BC: The Fraser Institute.

Hickson, G.B., W.A. Altemeier, and J.M. Perrin (1987). "Physician reimbursement by salary or fee-for-service: effect on physician practice behaviour in a randomized prospective study." *Paediatrics* 80: 344–50.

Hilless, Melissa, and Judith Healy (2001). *Health Care Systems in Transition: Australia.* Denmark: European Observatory on Health Care Systems.

Hofmarcher, Maria M., and Herta Rack (2001). *Health Care Systems in Transition: Austria.* Denmark: European Observatory on Health Care Systems.

Hjertqvist, Johan (2001a). *Competition in Emergency Healthcare: The Great Stockholm Challenge.* Swedish Health Reform Newsletter. Winnipeg, MB: Frontier Centre for Public Policy.

——— (2001b). *Swedish Healthcare in Transition.* AIMS Health Care Commentary. <http://www.aims.ca/commentary/Sweden/newsletter1.pdf>.

——— (2001c). The Internet Empowers Swedish Healthcare Consumers: Waiting List Info Shapes Patient Choices. Swedish Health Reform Newsletter. Winnipeg, MB: Frontier Centre for Public Policy.

——— (2002). *When the Employees Take Over … Employee Ownership Creeps into Sweden's Health System.* Swedish Health Reform Newsletter. Winnipeg, MB: Frontier Centre for Public Policy.

Hjortsberg, Catharina, and Ola Ghatnekar (2001). *Health Care Systems in Transition: Sweden.* Denmark: European Observatory on Health Care Systems.

Horry, Isabella, and Michael Walker (1994). *Government Spending Facts Two.* Vancouver, BC: The Fraser Institute.

Hsia, David C., and Cathaleen A. Ahern (1992). "Good quality care increases hospital profits under prospective payment." *Health Care Financing Review* Spring 13, 3: 17–24.

Hunink, Maria, Lee Goldman, Anna Tosteson, Murray Mittleman, Paula Goldman, Lawrence Williams, Joel Tsevat, and Milton Weinstein (1997). "The recent decline in mortality from coronary heart disease, 1980–1990." *Journal of the American Medical Association* 277, 7: 535–42.

Imai, Yutaka (2002). "Health care reform in Japan." Economics Department Working Papers 321. Paris: OECD.

Imai, Yutaka, Stéphane Jacobzone, and Patrick Lenain (2000). "The changing health system in France." Economics Department Working Papers 269. Paris: OECD.

Jackson, N.W., M.P. Doogue, and J.M. Elliott (1999). "Priority points and cardiac events while waiting for coronary artery bypass surgery." *Heart* 81: 367–73.

Järvelin, Jutta (2002). *Health Care Systems in Transition: Finland.* Denmark: European Observatory on Health Care Systems.

Jeong, Hyoung-Sun, and Jeremy Hurst (2001). "An assessment of the performance of the Japanese health care system." Labour Market and Social Policy—Occasional Papers 56. Paris: OECD.

Joseph, A.E., and D.R. Phillips (1984). *Accessibility and Utilization: Geographic Perspectives on Health Care Delivery.* New York, NY: Harper and Rowe.

Keeler, Emmett B., Joseph P. Newhouse, and C.E. Phelps (1977). "Deductibles and the demand for medical care services: The theory of a consumer facing a variable price schedule under uncertainty." *Econometrica* 45, 3 (April): 641–55.

Koen, Vincent (2000). "Public expenditure reform: The health care sector in the United Kingdom." Economics Department Working Papers 256. Paris: OECD.

Kornai, Janos (1992). *The Socialist System: The Political Economy of Communism.* Princeton, NJ: Princeton University Press.

Krasnik, A., et al. (1990). "Changing remuneration systems: effects on activity in general practice." *British Medical Journal* 300: 1698–701.

Krieble, Todd A. (2000). "New Zealand." *Journal of Health Politics, Policy and Law* 25, 5: 925–30.

Law, Marc, and Fazil Mihlar (1996). "A case for repealing the Canada Health Act." *Fraser Forum* (October): 26–28.

Lefall, L.D. (1981). "Colorectal cancer—prevention and detection." *Cancer* 47, 5 (Supplement): 1170–72.

Le Grand, Julian (1982). *The Strategy of Equality, Redistribution and the Social Services.* London: George Allen & Unwin.

——— (2002). "Further tales from the British National Health Service." *Health Affairs* 21, 3: 116–28.

Lindbeck, Assar (1997). "The Swedish Experiment." *Journal of Economic Literature* 35, 3: 1273–319.

Lindsay, Cotton M. (1976). "A theory of government enterprise." *Journal of Political Economy* 84: 1061–77.

Lipsey, Richard C., and Peter O. Steiner (1978). *Economics*. London: Harper & Row.

Lofgren, Ragnar (2002). T*he Swedish Health Care System: Recent Reforms, Problems, and Opportunities*. Public Policy Sources 59. Vancouver, BC: The Fraser Institute.

Lohr, J.N., et al. (1986). "Termination of medical benefits: Does it affect health?" *New England Journal of Medicine* 311, 6: 480–84.

Ma, Ching-To Albert, and Thomas G. McGuire (1997). "Optimal health insurance and provider payment." *The American Economic Review* 87, 4: 685–704.

McArthur, William (1996). "Private hospitals improve public sector health care." *Fraser Forum* (December): 24–26.

McArthur, William, Cynthia Ramsay, and Michael Walker (1996). *Healthy Incentives: Canadian Health Reform in an International Context.* Vancouver: The Fraser Institute.

McClellan, Mark (1995). "Uncertainty, health-care technologies, and health-care choices." *The American Economic Review* 85, 2: 38–44.

McMahon, Fred, and Martin Zelder (2002). *Making Health Spending Work.* Public Policy Sources 54. Vancouver, BC: The Fraser Institute.

McPherson, K., et al. (1981). "Regional variations in the use of common surgical procedures: within and between England and Wales, Canada and then United States." *Social Science and Medicine* 15a: 273–88.

Megginson, William L., and Jeffery M. Netter (2001). "From state to market: A survey of empirical studies on privatization." *Journal of Economic Literature* 39, 2: 321–89.

Ministry of Health, Denmark (2001). *Health Care in Denmark*. <http://www.sum.dk/health/sider/print.htm>.

Moise, Pierre, Stéphane Jacobzone, and the ARD-IHD Experts Group (2003). "OECD study of cross-national differences in the treatment, costs and outcomes of ischaemic heart disease." OECD Working Papers. <http://www.oecd.org>.

Naylor, C. David (2002). "Your money and/or your life?" *Canadian Medical Association Journal* 166, 11: 1416–17.

Naylor, C. David, K. Sykora, S.B. Jaglal, S. Jefferson, et al. (1995). "Waiting for coronary artery bypass surgery: Population-based study of 8517 consecutive patients in Ontario, Canada." *Lancet* 346: 1605–09.

Newhouse, Joseph P. (1996). "Policy watch: Medicare." *The Journal of Economic Perspectives* 10, 2: 159–67.

Newhouse, Joseph P. and the Insurance Experiment Group (1993). *Free for All? Lessons from the RAND Health Insurance Experiment.* Cambridge: Harvard University Press.

Niskanen, William A. Jr. (1971). *Bureaucracy and Representative Government.* Chicago: Aldine-Atherton.

Nolte, Ellen, and Martin McKee (2003). "Measuring the health of nations: analysis of mortality amenable to health care." *British Medical Journal* 327 (November 15): 1129–32.

Or, Zeynep (2001). "Exploring the effects of health care on mortality across OECD countries." Labour Market and Social Policy—Occasional Papers 46. <http://www.oecd.org>.

——— (2002). "Improving the performance of health care systems: From measures to action (a review of experiences in four OECD countries). Labour Market and Social Policy—Occasional Papers 57. <http://www.oecd.org>.

Organisation for Economic Cooperation and Development (2000). *OECD Economic Surveys: Switzerland.* Paris: OECD

——— (2001). *OECD Health Data 2001: A Comparative Analysis of 29 Countries.* CD-ROM. Paris: OECD.

——— (2002). *OECD Health Data 2002: A Comparative Analysis of 30 Countries,* 4th ed. CD-ROM. Paris: OECD.

——— (2003). *OECD Health Data 2003: A Comparative Analysis of 30 Countries,* 3rd ed. CD-ROM. Paris: OECD.

Orosz, Eva, and Andrew Burns (2000). "The healthcare system in Hungary." Economics Department Working Papers 241. Paris: OECD.

Ovretveit, J. (2001). "Private healthcare in the Nordic countries." *Health Management* (November): 22–34.

Oxley, Howard, and Maitland MacFarlan (1994). "Health care reform: Controlling spending and increasing efficiency." Economics Department Working Papers 149. Paris: OECD.

Park, R.E., et al. (1986). *Physician Ratings of Appropriate Indications for Six Medical and Surgical Procedures.* R-3280-CWF/ HF/PMT/RWJ Rand/UCLA Health Services Utilization Study. Santa Monica, CA: RAND Corporation.

Paul-Shaheen, P., J.D. Clark, and D. Williams (1987). "Small area analysis: A review and analysis of the North American literature." *Journal of Health Politics, Policy and Law* 12: 741–809.

Pauly, Mark V. (1968). "The economics of moral hazard: Comment." *The American Economic Review* 58: 531–37.

——— (1987). "Nonprofit firms in medical markets." *American Economic Review* 77: 257–62.

Pfaff, Martin, and Dietmar Wassener (2000). "Germany." *Journal of Health Politics, Policy and Law* 25, 5: 907–14.

Phelps, C.E. (1992). *Health Economics.* New York, NY: Harper Collins.

Poullier, Jean-Pierre, and Simone Sandier (2000). "France." *Journal of Health Politics, Policy and Law* 25, 5: 899–905.

Rachlis, Michael, Robert G. Evans, Patrick Lewis, and Morris L. Barer (2001). *Revitalizing Medicare: Shared Problems, Public Solutions.* Vancouver, BC: Tommy Douglas Research Institute.

Ramsay, Cynthia (1998). *Medical Savings Accounts: Universal, Accessible, Portable, Comprehensive Health Care for Canadians.* Critical Issues Bulletin (May). Vancouver, BC: The Fraser Institute.

Randall, Ed (2001). *The European Union and Health Policy.* New York: Palgrave.

Ransom, Scott B., S. Gene McNeeley, Michael L. Kruger, Gerry Doot, and David B. Cotton (1996). "The effect of capitated and fee-for-service remuneration on physician decision making in gynaecology." *Obstetrics & Gynecology,* 87, 5: 707–10.

Rice, T., and R. Labelle (1989). "Do physicians induce demand for medical services?" *Journal of Health Politics, Policy and Law* 14: 587–600.

Richardson, J.R.J. (1981). "The inducement hypothesis: that doctors create the demand for their own services." In J. van der Gaag and M. Perlman, eds., *Health, Economics, and Health Economics (*Amsterdam: North Holland):189–214.

Rochaix, L. (1993). "Financial incentives for physicians: The Quebec experience." *Health Economics* 2: 163–76.

Rossister, L.F., and G.R. Wilensky (1981). "The magnitude and determinants of physician initiated visits in the United States." In J. van der Gaag and M. Perlman, eds., *Health, Economics, and Health Economics (*Amsterdam: North Holland): 215–43.

——— (1983). "The relative importance of physician initiated visits in the United States." *Millbank Memorial Quarterly/ Health Society* 61: 252–77.

Rutstein, David D., William Berenberg, Thomas C. Chalmers, Charles G. Child 3rd, Alfred P. Fishman, and Edward B. Perrin (1976). "Measuring the quality of medical care: A clinical method. *New England Journal of Medicine* 294, 11: 582–88.

Scandlen, Greg (2001). "Propping up SCHIP: Will this program ever work?" NCPA Brief Analysis 371.

——— (2002). "Health care in five nations." NCPA Brief Analysis 397. <http://www.ncpa.org/pub/ba/ba397/>.

Schoen, Cathy, Robert J. Blendon, Catherine M. DesRoches, and Robin Osborn (2002). *Comparison of Health Care System Views and Experiences in Five Nations, 2001. Findings from the Commonwealth Fund 2001 International Health Policy Survey.* The Commonwealth Fund. <http://www.cmwf.org>.

Seeman, Neil (2003). "Canada's missing news—part ii. lower infant mortality rankings." *Fraser Forum* (March): 20–21.

Selick, Karen (1995). "Three cheers for two tiers." *Fraser Forum* (July): 29–30.

Semmens, J.B., and C. Platell (2001). "Bowel cancer. Positive expectations for improvements in outcomes." *Australian Family Physician* 30, 6: 539–45.

Siciliani, Luigi, and Jeremy Hurst (2003). "Explaining waiting times variations for elective surgery across OECD countries." OECD Health Working Papers. <http://www.oecd.org>.

Sine, J.J. (1994). *Demand for Episodes of Care in the China Health Insurance Experiment.* RGSD-110. RAND Graduate School.

Slovak Republic Ministry of Health (2003). *Platby za služby súvisiace so zdravotnou starostlivosťou*. <http://www.health.gov.sk>.

Smee, Clive (2000). "United Kingdom." *Journal of Health Politics, Policy and Law* 25, 5: 945–51.

Stano, M. (1987). "A further analysis of the physician inducement controversy." *Journal of Health Economics* 6: 197–211.

Stoddart, G., and Morris Barer (1981). "Analysis of demand and utilization through episodes of medical services." In J. van der Gaag and M. Perlman, eds., *Health, Economics, and Health Economics (*Amsterdam: North Holland): 149–70.

Stone, Deborah A. (2000). "United States." *Journal of Health Politics, Policy and Law* 25, 5: 953–58.

Swedish Institute, The (1999). *Fact Sheets on Sweden: The Health Care System in Sweden.* <http://www.si.se/docs/infosweden/ engelska/fs76.pdf>.

Swyer, P.R. (1993). "Organisation of perinatal/neonatal care." *Acta Paediatrica, Supplement* 385L: 1–18.

Technological Change in Health Care (TECH) Research Network (2001). "Technological change around the world: Evidence from heart attack care." *Health Affairs* 20, 3: 25–42.

The Commonwealth Fund (1998). *Multinational Comparisons of Health Care: Expenditures, Coverage, and Outcomes.* <http://www.cmwf.org/programs/international/ihp_1998_multicompsurvey_ 299.asp>.

The Standing Senate Committee on Social Affairs, Science, and Technology (2002). *The Health of Canadians—The Federal Role. Volume Three—Health Care Systems in Other Countries.* <http://www.parl.gc.ca/>.

Tomal, Annette (1998). "The relationship between hospital mortality rates, and hospital, market and patient characteristics." *Applied Economics* 30: 717–25.

Tuffs, Annette (2004). "German health reform likely to raise costs for patients." *British Medical Journal* 328: 70.

Tussing, A.D. (1983). "Physician induced demand for medical care: Irish general practitioners." *Economic and Social Review* 14: 225–47.

Tussing, A.D., and M.J. Wojtowycz (1986). "Physician induced demand by Irish GPs." *Social Science and Medicine* 23: 851–60.

US Department of Health and Human Services (2002). *Medicare & You 2002.* <http://www.medicare.gov>.

US Congress, Office of Technology Assessment (1995). *Health Care Technology and Its Assessment in Eight Countries.* OTA-BO-H-140, Washington, DC: US Government Printing Office.

US Government (2002). *Medicare: The Official U.S. Government Site for People with Medicare.* <http://www.medicare.gov>.

Vallgårda, Signild, Allan Krasnik, and Karsten Vrangbæk (2001). *Health Care Systems in Transition: Denmark.* Denmark: European Observatory on Health Care Systems.

Van den Noord, Paul, Terje Hagen, and Tor Iversen (1998). "The Norwegian health care system." Economics Department Working Papers 198. Paris: OECD.

Vayda, E. (1973). "A comparison of surgical rates in England and Wales." *New England Journal of Medicine* 289: 1224–29.

Wagstaff, A., and E. van Doorslaer (1992). "Equity in the finance of health care: Some international comparisons." *Journal of Health Economics* 11, 4: 361–87.

Walker, Michael (1993). "Lessons from the misplaced penis caper." *Fraser Forum* (September): 27–28.

Walker, Michael, with Greg Wilson (2001). *Waiting Your Turn: Hospital Waiting Lists in Canada, 11th ed.* Critical Issues Bulletin (September). Vancouver, BC: The Fraser Institute.

Wennberg, J.E., B.A. Barnes, and M. Zubkoff (1982). "Professional uncertainty and the problem of supplier induced demand in the demand for medical care." *Milbank Memorial Quarterly/Health and Society* 61: 252–77.

Wiley, Miriam M. (2000). "Ireland." *Journal of Health Politics, Policy and Law* 25, 5: 915–23.

Wilson, Samuel E., and William P. Longmire (1978). Does method of surgeon payment affect surgical care?" *Journal of Surgical Research* 24, 6: 457–68.

World Health Organization Regional Office for Europe and European Commission (1997a). *Highlights on Health in France.* <http://www.who.dk/>.

——— (1997b). *Highlights on Health in the Netherlands.* <http://www.who.dk/>.

——— (1998). *Highlights on Health in Ireland.* <http://www.who.dk/>.

——— (2000). *Highlights on Health in Iceland.* <http://www.who.dk/>.

Zelder, Martin (1999). *How Private Hospital Competition Can Improve Canadian Healthcare.* Public Policy Source 35. Vancouver, BC: The Fraser Institute.

Zelder, Martin (2000a). "Spend more, wait less? The myth of underfunded care in Canada." *Fraser Forum* (August Special Issue).

——— (2000b). "Canadian health reformers should understand RAND." *Fraser Forum* (February): 8–10.

——— (2000c). "The ultimate health care reform." *Fraser Forum* (February): 15–16.

——— (2000d). "Questioning Medicare's "advantages": Does risk-pooling matter?" *Fraser Forum* (December): 22–23.

Zweifel, Peter (2000). "Switzerland." *Journal of Health Politics, Policy and Law* 25, 5: 937–44.