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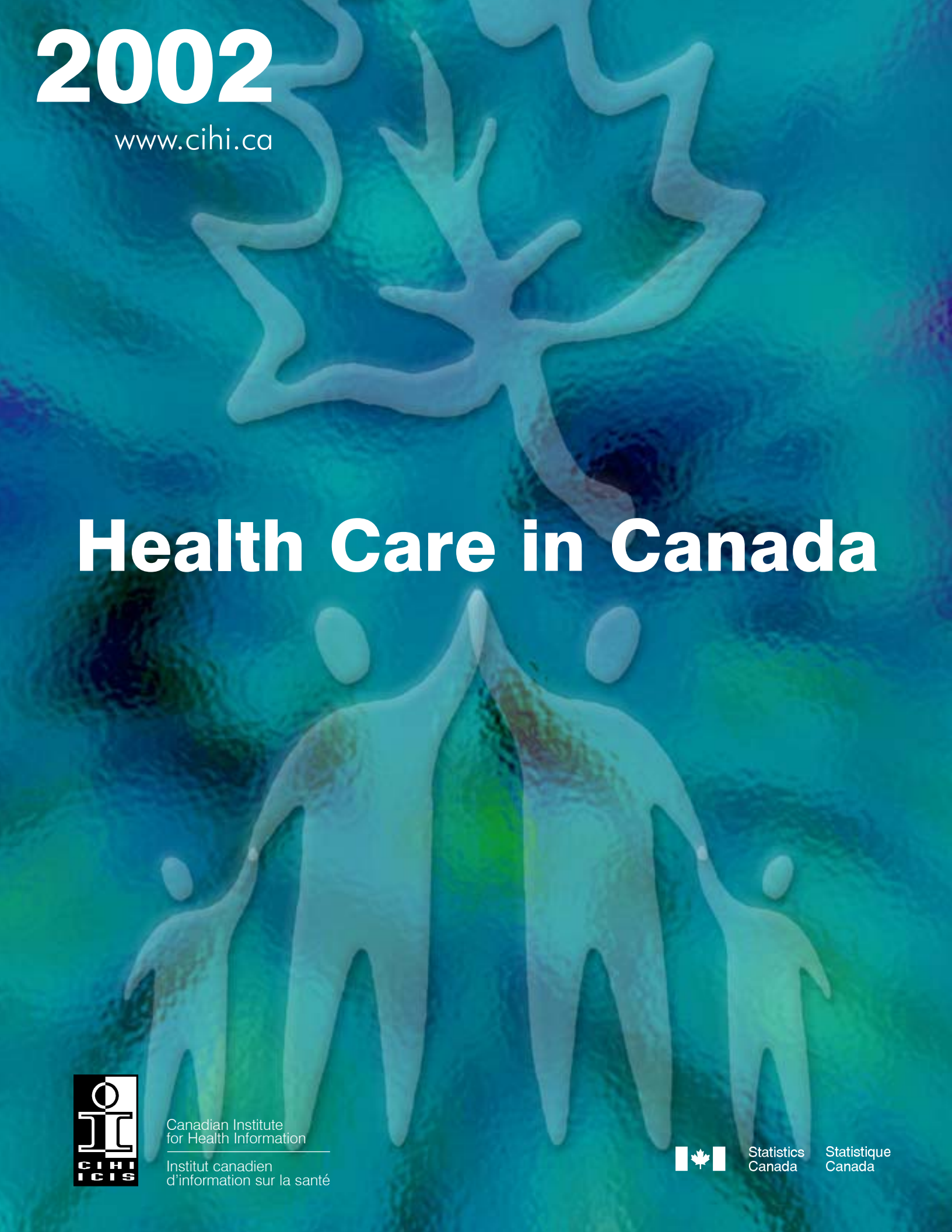
Health Care in Canada



Canadian Institute for Health Information

Institut canadien d'information sur la santé

Statistics Canada

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2002

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Health Care in Canada

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About the Canadian Institute for Health Information

Since 1994, the Canadian Institute for Health Information (CIHI), a pan-Canadian, independent, not-for-profit organization, has been working to improve the health of the health system and the health of Canadians by providing reliable and timely health information. The Institute's mandate, as established by Canada's health ministers, is to develop and maintain a common approach for health information in this country. To this end, CIHI provides information to advance Canada's health policies, improve the health of the population, strengthen our health system, and assist leaders in the health sector to make informed decisions.

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Statistics Canada is authorized under the Statistics Act to collect, compile, analyze, abstract, and publish statistics related to the health and well-being of Canadians. The Health Statistics Division's primary objective is to provide statistical information and analyses about the health of the population, determinants of health, and the scope and utilization of Canada's health care sector.

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It should be noted that the analyses and conclusions in the report do not necessarily reflect those of the individual members of the Expert Group or their affiliated organizations.

The editorial committee for the 2002 report included Steven Lewis, Jennifer Zelmer, and Kira Leeb. Core members of the project team also included Matthew Alexander, Dalila Bakhti, Lisa Brazeau, Janet Brown, Judy Brown, Paulina Carrion, Zeerak Chaudhary, Ruth Diaz, Shelley Drennan, Kristina Dubois, Lynne Duncan, Patricia Finlay, Glenda Gagnon, Lise Gagnon, Cheryl Gula, Sharon Gushue, Erin Kennedy, Anne Lauzon, Anick Losier, Laura MacLeod, Haider Mannan, David Marshall, Christina Mathers, Karen McCarthy, Christa Morley, Lise Poirier, Joan Porter, Marie Pratte, Indra Pulcins, Maria Santos, Karin Schoeberle, Serge Taillon, Linda Turner, Eugene Wen, Juliann Yang and Scott Young.

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Chapter Highlights

Care and Caring

What We Know

- Life expectancy at birth in Canada was 79 years in 1997, among the highest in the world. But not everyone has the same chances for a long and healthy life. Women have a higher life expectancy than men. There are also variations among regions across Canada. Differences also exist in how Canadians rate their own health. Overall, nearly two-thirds (61%) of Canadians aged 12 and older said that their health was very good or excellent in 2000/2001.
- In 2000/2001, most Canadians (78% aged 12 and older) reported that they had consulted a family doctor at least once in the last year. Many also sought care from other health professionals. Consultations with dentists/orthodontists (60%), eye specialists (38%), and other medical doctors (28%) were among the most common.
- Canadians spent almost 21 million days as inpatients in acute care hospitals in 1999/2000, down 15.6% from 1994/1995. In contrast, more and more patients underwent day surgery over this period. For example, the number treated grew by 18% in Ontario.
- Hospitals in several provinces now track how long patients wait in the emergency department after a health professional decides that they need to be admitted. Data from Nova Scotia, New Brunswick, and Ontario show a median wait time of approximately 1.5 hours in 2000/2001.
- About 4.9 million (or 19%) Canadians aged 12 and older reported seeing a chiropractor or other type of complementary and alternative health practitioner in 2000/2001, up from 14% in 1994/1995.
- At the same time, 13% of Canadians reported perceived unmet health care needs in 2000/2001, up from 6% in 1998/1999. Of these, half (50%) said that their reasons for not getting care related to availability of care, including long wait times.

What We Don't Know

- What is the impact of increased day surgery on the relative roles of the hospital, homecare, and self care? How well is the changing mix of hospital services meeting community needs?
- How does patient satisfaction with hospital care and other types of services compare across the country? What factors explain higher and lower satisfaction levels?
- How do wait times compare across the country? What percentage of wait times fall within recommended guidelines for different treatments? What is the emotional and physical impact of waiting for different types of care?

The People, the Cost, the Information

What We Know

- More than 1.5 million Canadians worked in health care and social services in 2000. The largest regulated health professions are nursing (232,000 RNs worked in nursing in 2000) and medicine (57,800 physicians worked in clinical and non-clinical practice in 2000). The numbers, geographic distribution, workplaces, worklife, scopes of practice, and other characteristics of these and other health professionals continue to evolve over time.
- Canada's health care spending is higher than ever before. It passed the $100 billion mark for the first time in 2001. In total, we spent $102.5 billion (forecast) to improve or maintain our health, an average of about $3,300 per person. Hospitals still account for the largest share of spending (32% in 2001), but spending on drugs—now accounting for 15%—displaced spending on physician services (14% in 2001) as the second largest cost driver in 1997.
- According to Statistics Canada's Survey of Household Spending, average health care spending *per household* in Canada in 2000 was $1,357, up from $1,009 in 1996. The largest share was for health insurance premiums, followed by medicinal and pharmaceutical products and dental services. Health care spending also differed by household income. The highest income group spent more than three times as much on health care as the lowest income group, adjusted for household size. But the low-income group spent a larger share of its after-tax income on health care in 2000 (3.9% versus 2.6%).
- Today's students are facing rising health education costs. For example, the average annual tuition fees for dentistry programs rose from $5,425 to $8,491 (a 57% increase) between 1998/1999 and 2001/2002. Over the same period, average tuition for medical students increased 39% (to $6,654).
- Governments in all parts of the country fund some homecare services, but what is covered varies from place to place. In 1998/1999, Canadian governments spent just under $3 billion on homecare, up significantly over the last decade.
- The Internet has become a source of health information for patients and physicians alike. For example, a recent survey by the Canadian Medical Association reported that almost 80% of doctors were using the Internet at their home or office and 30% were referring their patients to web sites on occasion.

What We Don't Know

- Given demographic, workforce, health, health care and other trends, how does the current combination of healthcare providers align with the health needs of the current and future Canadian population?
- What impact will changes in regulatory models and professional scopes of practice have on the supply and distribution of health professionals, on our ability to meet future healthcare needs, on how professionals organize and provide services, and on the quality of care?
- How might different mixes of public and private funding and service delivery, particularly in rapidly expanding areas such as drugs and home care, affect costs, access, quality, and patient outcomes and satisfaction?

- How much is spent each year specifically on health promotion and prevention activities in Canada? How is this changing?
- What are the effects on health and health care of the increasing access by individual Canadians and care providers to vast amounts of health information over the Internet?

Outcomes of Care

What We Know

- Overall, 19.2% and 12.6% of patients died in a hospital within 30 days of initial hospitalization for a stroke or a heart attack, respectively between 1997/1998 and 1999/2000. After adjusting for differences in age, sex, and comorbidity, most of Canada's largest regions (populations over 100,000) had mortality rates that were about the same as this average, but some had higher or lower rates.
- Across all regions (large and small), 7.3% of heart attack, 6.4% of asthma, 1% of hysterectomy, and 2.5% of prostatectomy patients had an unplanned return to hospital within 28 days due to a related health problem. Most regions had rates that were similar to the overall rates, but some were significantly different, even after adjusting for differences in risk factors.
- Five-year relative survival rates for people diagnosed with some cancers vary depending on where you live. For example, five-year relative survival for people diagnosed with prostate (91%) or breast cancer (85%) was highest in British Columbia. This compares to national rates of 87% and 82% respectively.
- People receiving kidney or heart transplants between 1995 and 2000 had better survival chances than those who received transplants between 1989 and 1994.
- For many types of care and for many different surgeries, research shows that patients treated in hospitals with higher numbers of cases are often less likely to have complications or to die after surgery. Most Canadians receive surgery in high-volume hospitals, but many hospitals perform a very small number of procedures. For example, almost one in four pancreatic cancer surgeries—also known as Whipple procedures—performed in 1999/2000, were done in hospitals that did fewer than five annually. Some hospitals perform more than 25 procedures per year.

What We Don't Know

- What explains regional differences in mortality, readmissions, and survival rates?
- For which, if any, surgeries do hospitals performing low numbers of operations place patients at higher risk of complications and death? For these procedures, what is the optimal or minimum number of cases a hospital should perform to provide safe and effective care? How many deaths could potentially be prevented by ensuring that surgery is provided at high-volume centres? What would be the other trade-offs if surgical procedures were centralized?
- What is the relationship between how much we spend on particular interventions and the benefits they provide?
- How healthy are patients three, six, and 12 months after most types of surgery?

Public Health: On Guard Year After Year

What We Know

- Smoking remains a public health challenge for Canada. In 2000/2001, 5.5 million Canadians aged 12 or older (almost 22%) said that they smoked cigarettes daily, including 13% of 12 to 19 year olds and 10% of seniors. The proportion of Canadians who reported smoking daily has decreased over the past two decades. In 1978/1979, 37% of those 15 years and older reported smoking daily.
- Canadian children are routinely vaccinated against nine diseases: polio, pertussis (whooping cough), tetanus, diptheria, Haemophilus influenzae type b (Hib), measles, mumps, rubella, and hepatitis B. Provinces and territories each develop their own routine schedules for childhood vaccinations.
- In 2000/2001, Statistics Canada asked Canadians if they had had a flu shot in the last year. About two in three seniors (65%) said yes, up from just over half (51%) in 1996/1997. This compares to 27% of Canadians aged 12 and older, up from just under 15% in 1996/1997.
- About a billion people living in developing countries are at risk because they are without clean drinking water, according to United Nations estimates. Most Canadians are more fortunate. We generally have access to safe drinking water, although outbreaks of water-borne disease occur from time to time.
- The Canadian Task Force on Preventive Health Care weighs the evidence on what should and should not be included in regular checkups for Canadians of different ages. For example, they recommend routine screening mammograms for women aged 50 to 69 years and pap smears for women from when they become sexually active or turn 18 (whichever is earlier) until age 69. In 2000/2001, 70% of Canadian women aged 50 to 69 reported receiving a mammogram for screening or other purposes in the last two years. More (73% of those 18 to 69) reported receiving a Pap smear in the last three years.

What We Don't Know

- How many Canadians are affected by food- or water-borne illness each year? What are the short and long-term health consequences of their illness?
- How many children receive all recommended immunizations on schedule?
- Which among the wide variety of possible health promotion strategies, many of which aim to influence health outcomes far into the future, offer the most health gains relative to resources expended?
- How do voluntary, community, and mutual aid groups, as well as the corporate sector, contribute to health promotion, disease prevention, and health protection efforts?

Medicating Illness: Drug Use and Cost in Canada

What We Know

- Millions of Canadians take medications daily. Almost eight in ten Canadians aged 12 and older (78%) said that they had used one or more prescribed or over-the-counter medications in the last month in 1998/1999. Women and older Canadians were more likely than others to report using medications.
- Painkillers—ranging from aspirin to morphine—are among the most commonly used drugs. According to a 1998/1999 Statistics Canada survey, about 65% of Canadians 12 and older said they had taken painkillers in the last month. Other commonly used drugs include heart medications (13%), stomach remedies (13%), penicillin or other antibiotics (8%), sleeping pills and tranquilizers (5%), and antidepressants (4%).
- Retail drug sales became the second largest category of total public and private health spending (after hospitals) in 1997, overtaking physician services. In total, Canadians are expected to have spent over $15.5 billion on drugs in 2001, up 8.6% from the previous year. That is just over $500 per person.
- In 2000, manufacturers sold about $6.3 billion of patented medicines in Canada, according to the Patented Medicine Price Review Board (PMPRB). That's just under two-thirds (63%) of total drug sales across the country, up from 43.3% in 1995. Most of the remaining sales (28%) were non-patented, brand-name drugs sold by companies that also sell patented drugs. "Generic" drugs—copies of drugs for which the original patent(s) have expired—accounted for about 9% of sales in 2000.
- Three-quarters (75%) of Canadians aged 12 and older reported having some public or private insurance coverage (with varying levels of deductibles) for prescription drugs in 1998/1999. Young adults and low-income Canadians were least likely to say that they were insured. In part, this likely reflects the fact that private insurance is often a benefit of employment, covering employees and their dependents.

What We Don't Know

- How have changes in patent protection and provincial/territorial drug programs and formularies affected drug utilization, costs, and patient outcomes?
- What strategies are most effective in controlling costs and increases in utilization, while ensuring high quality patient care?
- Are the drivers of recent increases in spending on drugs the same across the country?
- What approaches help patients and their caregivers to maximize the benefits of medications while minimizing risks?

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It's Your Turn

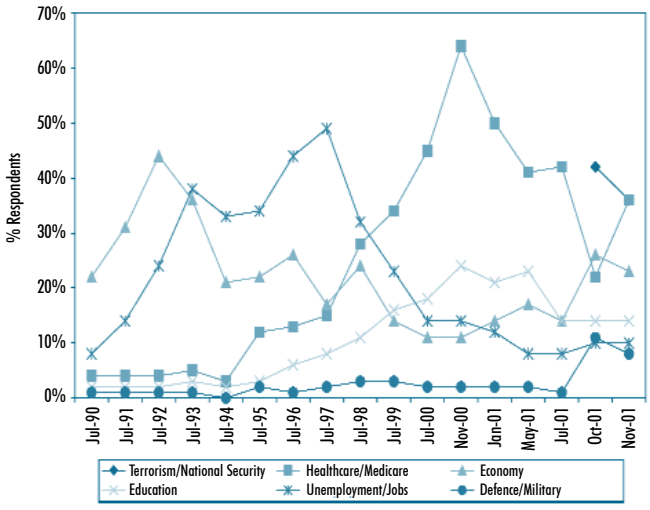
About this Report

Health and health care continue to be top priorities for Canadians. In the past year, several provinces have completed strategic reviews of their health systems; others have launched new studies. At the federal level, the Kirby Commission, (undertaken by the Standing Senate Committee on Social Affairs, Science and Technology and led by Senator Kirby) and the Commission on the Future of Health Care in Canada, led by Roy Romanow, both released interim reports. Despite differences in emphasis and approach, a common theme appears in all these studies and reports: that we cannot improve what we cannot measure—and we cannot measure without timely and reliable data that provide an accurate picture of the health of the population and how well the health care system is functioning.

Health Care in Canada 2002, a joint enterprise of the Canadian Institute for Health Information (CIHI) and Statistics Canada, is the third in a series of annual reports launched in 2000. It is part of an ongoing commitment to provide reliable data and analyses to inform the public debate. Each report builds on those that have gone before, as well as on research gathered at the local, regional, provincial, territorial, national, and international levels. Feedback provided by health professionals, researchers, individual Canadians, the media, and others also help identify new content areas.

Canadians' Primary Concerns **1**

What issues do you feel are the most important facing Canada? The graph below shows the top six national issues identified by Canadians answering Ipsos-Reid polls over the last decade. In November 2000, health care was cited most often as the greatest priority facing the country. Opinions have fluctuated recently, reflecting the events of September 11th, 2001.



Source: Ipsos-Reid.

Each year, we provide updated data and expanded analyses on issues of enduring relevance, as well as new information on emerging topics. Who is using what types of health services? What do Canadians think about our health care system? How is it changing? Are important aspects of care—such as wait times and patient outcomes—improving? Are costs increasing or decreasing? These are but a few examples of the questions addressed in *Health Care in Canada 2002*.

We are fortunate to have better information today than we had in the past to support many decisions in health care. But gaps remain. We hope, by highlighting examples of what we know and don't know about many of the topics presented here, we can continue to work with partners across the country to narrow these gaps over time.

The report is divided into three parts:

Part A: Inside Canada's Health Care System provides current information on the continuum of care offered by our health care system, on the professionals involved in providing that care, and on the associated costs and resources used.

Part B: In-Depth Reports focuses on three areas in detail: outcomes of care for specific diseases and procedures, public health programs and results, and medication use and expenditures.

Part C: A Look Ahead looks at the on-going challenge of filling out our understanding of how and how well the health care system functions.

The report also includes an insert entitled "*Health Indicators 2002*." This convenient reference features comparative data on a range of health and health system indicators for Canada's largest health regions (comprising more than 90% of the total population) and for the provinces and territories. Wherever the icon to the right appears beside the text, it indicates that related regional or provincial/territorial data can be found in the insert.

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New for 2002

Every year the *Health Care in Canada* report introduces new information on topics that are central to understanding our health care system. Our choices reflect both feedback received since the last report and new data that have become available. This year, for example, we focus on areas such as outcomes of care, drug use and expenditure, and public health. The importance of these topics partly reflects shifts in approaches to health care and how we think about health. Examples of the kinds of new information contained in this year's report are listed below. A more complete list is available at www.cihi.ca.

- How patients' chances of dying in hospital within 30 days of an initial admission with a heart attack or stroke (adjusted for differences in several key risk factors) vary region by region, across the country.
- How the amount that low-income Canadian households spend directly on health care compares to that spent by those in higher income brackets.
- How the chances vary, region by region, across the country that patients who are hospitalized with a heart attack, asthma, or for a hysterectomy or prostatectomy have to return to the same or another hospital for a related condition (adjusted for differences in several key risk factors).
- How often different types of surgery are performed at high, medium, and low volume centres and how rates of surgery vary.
- How Canada's largest health regions (covering more than 90% of the total population) compare with respect to key health and health care indicators.
- How total retail drug sales per capita and prices for patented drugs in Canada compare with those in other countries.
- How long patients in emergency departments wait for a bed once it is determined that they require admission to hospital.
- Self-reported rates of the use of different types of health services and how they vary across the country.
- Who is most likely to receive mammograms and pap smears and how rates vary across the country.

For More Information

Highlights and the full text of *Heath Care in Canada 2002* are available free of charge on the CIHI Web site at: **www.cihi.ca**. To order additional copies of the report (a nominal charge applies to cover printing, shipping, and handling costs) please contact:

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The companion document *How healthy are Canadians 2002?* will also be available through the Web, following its upcoming release.

We welcome comments and suggestions about this report and on how to make future reports more useful and informative. For your convenience a feedback sheet, "It's Your Turn", is provided at the end of this report. You can also email your comments to healthreports@cihi.ca

There's Also More on the Web!

The print version of this report is only part of what you can find at our Web site (www.cihi.ca). As we did last year, on the day that *Health Care in Canada 2002* is released and in the weeks and months following, we will be adding a wealth of information to what is already available electronically. For example, it will be possible to:

- Download free copies of the report and the insert in English or French.
- Read highlights of the report in a plain language brochure.
- Sign-up to receive regular updates to the report via e-mail.
- View a presentation of the report's highlights.
- Access some of the documents and data used in preparing the report.
- Take an opportunity to look at previous annual reports (including an on-line index to all reports) and other related reports, such as *Canada's Health Care Providers* and CIHI's regular series of reports on aspects of health spending, health human resources, health services, and population health.

1. A Year in the Life of Canada's Health Care System

If a week is a long time in politics, a year is a very long time in health care. The stream of new science and technology, front-page headlines of health care magic and mayhem, analyses and reports, and new directions in public policy flows on. This chapter offers a brief review of some of the events in the past year in Canadian health care and sets the stage for the more detailed information contained in the report.

New Reports with Some New Twists

Over the last two years, Quebec, Saskatchewan, Alberta, and other jurisdictions tabled major reports about health care. Federal efforts—led by Roy Romanow and Senator Michael Kirby—are still in progress.

The completed reports have yielded some things old, and some things new. The strengths of the current system have a familiar ring. So do the critiques. For example, many argue that:

- information systems are obsolete and hinder efficient, effective care;
- primary care needs reorganization;
- integration of services remains an unrealized ideal; and
- rising costs are squeezing provinces' capacities to invest in other important areas.

A major new thrust is an emphasis on the importance of improving quality and reducing errors. For example, the Fyke Commission Report from Saskatchewan[1] advocates upgraded emergency response and a regionalized system of hospital care organized on a province-wide basis, recognizing the difficulties in providing high-quality acute care in most rural areas because of insufficient personnel and technology and low population densities. While the reports acknowledge continuous innovation at the clinical level, they also note that the system, as a whole, can be difficult to change—old cultures and attitudes persist.

Rethinking Health Care? 2

A series of Royal Commission and Task Force reports ushered in health care reform across Canada in the 1980s. As the new millennium begins, many governments have decided that it's time for another broad look at how health care is organized and delivered. Examples of recent and upcoming government-initiated Commission and Council reports are listed below. They are complemented by thoughts from a wide variety of academics, policy think tanks, health care associations and advocates, and individual Canadians.

Jurisdiction	Title (Lead)	Report Date	Web Site
New Brunswick	Health Renewal—A Discussion Paper	January 2002	www.gnb.ca/op_cpm
Quebec	Commission d'étude sur les services de santé et les services sociaux (Michel Clair)	January 2001	www.cessss.gouv.qc.ca
Saskatchewan	Commission on Medicare (Ken Fyke)	April 2001	www.health.gov.sk.ca
Alberta	A Framework for Reform, Premier's Advisory Council on Health (Don Mazankowski)	December 2001	www.premiersadvisory.com
British Columbia	Patients First: Renewal and Reform of British Columbia's Health Care System	December 2001	www.legis.gov.bc.ca/CMT
Northwest Territories	It's Time to Act: A Report on the Health and Social Services System of the Northwest Territories	June 2001	www.hlthss.gov.nt.ca
Federal	Commission on the Future of Health Care in Canada (Roy Romanow)	Interim: February 2001; Final: November 2002	www.healthcarecommission.ca
Federal	The Health of Canadians—The Federal Role (Michael Kirby)	Interim: March 2002 Final: June 30, 2002	www.parl.gc.ca

Source: Compiled by CIHI

And yet, these reports and their findings come at a time of considerable change in Canada's health care system. We continue to see important shifts in spending patterns, human resources, how the system is organized, primary care, science and technology, and other areas.

Costs Are Up… But Consider the Long View

Health care spending rose in 2001, as it has for the past four years. For the first time ever, the total bill came to more than $100 billion. Adjusted for inflation and population growth, spending was up 4.3% from the year before. Public sector spending grew by 5.7%. It now accounts for about 73% of the total.

While the last four years saw spending rise, the mid-1990s were a relatively lean period in post-Medicare funding history. The actual amount spent grew somewhat. But when inflation and population growth are taken into account, there was a dip.

The recent bust (roughly 1993-97) and boom (roughly 1997-2001) periods average out to about the long-term historical growth rate.

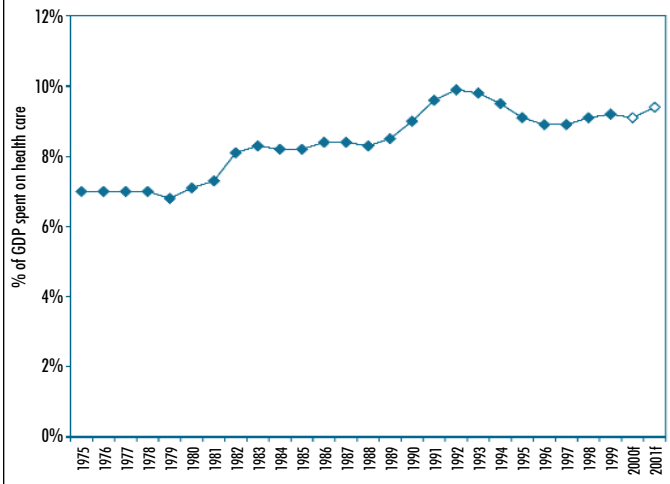
Will recent growth rates continue in 2002? Maybe, maybe not. The answer depends on wage settlements, government budgets, how much we each spend personally, and much more. This year's report profiles some of these factors in *Chapter 2: The People, The Cost, The Information*.

What happens may also depend on how governments respond to recent health care reports. Some of the reports suggested fiscal diagnoses and cures—sometimes firm, sometimes merely presented for consideration—are similar; others reveal a wide range of perspectives. For example, Quebec's Clair Commission[2] advocates private long-term care insurance. It suggests that this could be a source of new revenue to look after an aging population in the future (birth rates in Quebec are among the lowest in the world). Alberta's Mazankowski Report[3] recommends "diversifying the revenue stream," deinsuring certain medical services, and considering medical savings accounts and variable health insurance premiums. Early reports from the Federal Senate Committee on Social Affairs, Science and Technology also open the door to exploring alternate models. All three reports doubt that internal reforms can adequately contain costs and suggest exploring non-tax-based sources to finance increases.

By contrast, the Fyke Commission Report from Saskatchewan advocates far-ranging internal reforms, rather than seeking additional non-governmental revenue sources or reducing the comprehensiveness of publicly financed services. It is skeptical that expanding the non-public component of the system will either preserve equity or control costs.

Health Care's Share of the Economy **3**

In 2001, Canada spent about 9.4% of our gross domestic product (GDP), a measure of total economic output, on health care. That's up from the previous year's 9.1% because health care spending rose faster than overall economic growth. But it is still below the peak of 9.9% in 1992.



Note: Open symbols are forecast figures.

Source: National Health Expenditure Database, CIHI

Health Human Resources: A Top Preoccupation

Health care is a people business. About one in ten employed Canadians work in health and social services. If the right people aren't in the right places to deliver the right types of care, the system does not run smoothly.

There's a strong desire to understand better who they are, what they do, how many professionals we need, and how they can work more effectively together. Not surprisingly, health human resources emerged as the number one issue from an extensive consultation process with health experts in 2001.[4] And the media have been full of stories about recruitment, shortages, and contract negotiations.

Part of the challenge—and perhaps the opportunity—is that the jobs that health professionals do are changing. In some cases, they are taking on new roles. For example, Quebec recently changed its laws to allow nurses to act as surgeons' assistants. This means that they can perform some surgical tasks, such as stitching and closing wounds. In other cases, the scope of professionals' work is shrinking. For instance, more and more Ontario fee-for-service family doctors have office-only practices.[5] Fewer are working in emergency rooms, doing house calls, caring for patients while in hospital, and delivering babies.

Research doesn't tell us exactly what mix of what number of health professionals would work best for a particular community. Different parts of the country are using different strategies to find a balance that works. Some—like recruiting family doctors from other countries to practice in under-served rural areas—can have results in the short-term. (This strategy may also have other unintended consequences. In 2001, the South African High Commissioner to Canada asked that Canada stop recruiting their physicians because they are needed at home.[6]) Other strategies will take many years to show direct results. Examples include recent increases in enrollments in health science education programs and trials of new models of care.

Searching for Better Ways to Organize Health Care

Many provinces and territories 'regionalized' their health care systems over the past decade. How these health regions work, as well as what they do, continues to evolve.

Regionalization of Health Care 4

In the late 1980s and 1990s, most provinces and territories across Canada regionalized the delivery of health care. In some provinces, further restructuring has recently taken place.

Province	No. of Regional Health Authorities (or Equivalent)	Established	Governance Model
NF	12 boards in total with 6 institutional health boards (IBs), 4 health and community services boards (HCSBs), and 2 integrated boards.	1994	Appointed
PE	5 Regional Health Authorities (RHAs)	1993/1994	Elected/appointed
NS	9 District Health Authorities	1996; Restructured 2001	Appointed
NB	NB has 8 RHAs. One region has two RHAs, one French speaking and one English speaking.	1992; Restructured 2002	Currently appointed, but will move to elected/appointed by 2004
QC	18 régies régionales de la santé et services sociaux.	Between 1989 and 1992	Appointed
ON	Not regionalized 16 District Health Councils (Advisory)		
MB	12 RHAs	1997/1998	Appointed
SK	12 RHAs and 1 northern health authority.	1992; Restructured 2001/2002	Appointed
AB	17 RHAs	1994	Elected/appointed
BC	5 RHAs, 15 Health Service Delivery Areas, and 1 Provincial Health Service Authority	1997; Restructured 2001	Appointed
NU	Not regionalized		
NT	8 health and social service authorities; 5 are regional boards, 2 are community boards, and one serves the entire territory.	1988-1997; Restructured 2002	Appointed
YT	Not regionalized		

Source: Regionalization Research Centre, Health Services Utilization and Research Commission.

In general, governments have assigned health regions responsibility for the day-to-day operation of healthcare services for a defined geographic area. Goals varied. But most jurisdictions aimed to streamline services and to bring their planning and delivery closer to local residents.[7] Other common aims included increasing the focus on health promotion and committing more resources to community-based services.

The original objectives may have been similar, but the size, responsibilities, authorities, and structure of regions differ from coast to coast and are changing. For example, Saskatchewan recently collapsed 32 District Health Boards into 12 Regional Health Authorities. British Columbia is moving in the same direction. The 52 health authorities (11 Regional Health Boards, 34 Community Health Councils, and 7 Community Health Services Societies), became 5 Regional Health Authorities, 15 Health Service Delivery Areas, and one Provincial Health Service Authority in December 2001. Prince Edward Island announced a similar model in April 2002. Its four Health Regions (down from five) will be responsible for planning and delivering primary health and social services. A new Provincial Health Services Authority will take charge of more specialized services, including the province's two largest hospitals.

Governance structures are also changing in some provinces. For instance, Quebec and Saskatchewan recently switched to appointed (not elected) boards of directors. Alberta moved in the opposite direction. It held elections for two-thirds of board positions in October 2001. And New Brunswick will hold its first board elections in 2004.

Primary Care: The Elusive Reform

Primary health care occurs where you first contact the healthcare system—often in a physician's office, health clinic, or community health centre. It can also be a gateway to other types of care.

A desire to reform primary health care has been a constant theme over the past two decades. A common focus is to establish multi-disciplinary, comprehensive health centres that serve as the first point of contact for the public and provide an integrated and comprehensive range of non-specialized services.

Variants of such centres have existed for years, and there have been many demonstration and pilot projects of different models of care. But physician-centred solo and small group private practice remain the norm.[8] No province has universally implemented a fundamentally new primary care model; participation is generally voluntary.

There are signs that the pace of change may accelerate in the near future. In September 2000, Canada's premiers and the prime minister agreed that improvements to primary health care are crucial to the renewal of health services.[9] More recently, Ontario has announced plans to enroll 80% of the province's family doctors into teams or health networks by 2004.

Other provinces have also made plans for change. For example, Saskatchewan has set a target of 25% of doctors practicing in non-fee-for-service group practices within 4 years and 100% within a decade. The federal government has established a $800 million, 4-year, primary care fund to accelerate the transition to new primary care models.

Science and Technology Forge Ahead

Events unfold rapidly in the laboratory and at the bedside regardless of the nature and pace of system reform. In the past year, there have been new findings and new controversies.

In some cases, researchers have forged new ground. The revolution in genetics and molecular biology continues unabated.

Stem cell research, generating new cells from embryonic and adult tissue, was big news in 2002. Some argue that this type of research holds enormous promise for advances against diseases, such as multiple sclerosis, diabetes, and Parkinson's. Others suggest that it creates ethical dilemmas when the embryo is the main building block for the research and when cloning of cells becomes part of the scientific or therapeutic agenda. In response, the Canadian Institutes of Health Research published guidelines[10] and the federal government pledged to pass legislation on stem cell research.[11] It appears likely that the ethical debate and the scientific opportunities will continue to confront each other well into the future.

Scientific debate simmered in other areas as well, revealing, yet again, that some clinical issues are inherently complex and difficult to resolve. For example, the on-going mammography debate flared up in response to a Danish review that suggested the procedure was less effective than conventionally thought.[12] The study was widely discussed and firmly challenged.[13] The Canadian Cancer Society continues to advocate mammography for women aged 50-69. Its American counterpart has advocated screening for women over 40. And a consensus panel recently convened by the World Health Organization reviewed the literature in this area and concluded that mammography does reduce the risk of dying from breast cancer by about 35% in women aged 50 to 69, but that it offers only a slight benefit in younger women. This year's report profiles current levels of screening and other issues in *Chapter 3: Public Health: On Guard Year After Year*.

Other technologies, such as transplanting islet cells, are on the horizon. Islet cells produce insulin, helping the body use glucose for energy. If these cells do not produce enough insulin, a person develops diabetes. Pancreatic islet cell transplantation is being explored as a possible long-term treatment option for diabetics. However, while early results look promising, further research is required to determine long-term health outcomes.

More Changes to Come….

Health care will almost certainly continue to develop and change over the coming years. Some of these changes might come from on-going research on health, health services, and health outcomes. Others may come in response to recent reports. Already, this process has started. And more reports—as well as probably more changes—are coming.

The rest of this year's report focuses on current healthcare trends and the latest data and research. Our hope is that, in the weeks and months ahead, this information will provide a solid basis to support sound health policy, effective management of the health system, and public awareness of factors that affect health.

For More Information

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Part A: Inside Canada's Health Care System

Key Dates in Canadian Health Care Policy

- 1867: *British North American Act* establishes the basis for provincial responsibility for hospitals.
- 1947: Saskatchewan introduces Canada's first publicly funded universal hospital insurance program.
- 1958: The federal government passes the *Hospital Insurance and Diagnostic Services Act*. All provinces and territories were covered under the cost-sharing program for hospital insurance by 1961.
- 1966: The federal *Medical Care Act* introduces federal/provincial cost-sharing for physician services outside hospitals. By 1972, all provinces/territories are participating in the program.
- 1974: Marc Lalonde, the federal health minister, releases a report called A *New Perspective on the Health of Canadians*. It reinforces the idea of broad determinants of health (including human biology, the environment, lifestyle choices, and health care organization) and calls for a reorientation of healthcare services toward health promotion.
- 1977: The *Established Programmes Financing Act* introduces a program of federal transfers that are not directly tied to the costs of the provincial/territorial programs.
- 1984: The *Canada Health Act* reinforces the basic principles provinces and territories must meet to qualify for federal health funding (public administration and operation, comprehensiveness, universality, portability, and accessibility). It outlaws out-of-pocket charges for services covered under the Act.
- 1996/1997: The federal contribution to health and social services is consolidated into the *Canada Health and Social Transfer*, a major change in federal provincial/territorial cost-sharing arrangements for health services.

They call it "Internet time". The rapid development of the web means that yesterday's science fiction—instantly sending a message to your friend in Venezuela or scanning the world's vast medical literature in mere seconds—is today's reality.

A description of Canada's current healthcare system would probably have seemed equally far-fetched when the first hospital opened in Quebec City in 1639. The founding religious order offered a range of services, from making and dispensing medicines to surgery. One surgeon was on staff—a barber from France.

A century later, people living in larger communities in Upper Canada and the Maritimes who could afford to were likely to call on doctors to treat smallpox, influenza, typhoid, and other conditions. The poor often relied on home remedies or sought help from charities.

By the mid-19th century, the first medical schools were open. So were general hospitals in Montreal and Toronto. These hospitals depended on charitable organizations and the rich for donations. Patients often paid little or nothing for their care. The Ontario government began paying annual grants to the Toronto General after a lack of funds closed the hospital for a year in the 1870s.

By the mid-1900s, general improvements in living and working conditions and public health efforts meant Canadians were much less likely to die from infectious diseases. In 1947, Saskatchewan became the first province to introduce a publicly funded, universal hospital insurance program. Saskatchewan also led the way in insuring doctors' services—in 1962. Within a decade, all provinces and territories had followed Saskatchewan's lead. Today, each administers insurance plans guided by common pan-Canadian principles.

And yet, the more things change, the more they remain the same. Many of the core challenges we face today would be familiar to time-travelers from the past. Part A of this report highlights updated information on what is and is not changing in the complex web of health services that makes up today's healthcare system.

2. Care and Caring

How Healthy are Canadians?

The winds of change swept through Canada's health care system throughout the 20th century. But one thing that hasn't changed is that health is affected by much more than health care. Many factors—where and how we grow up, live, and work; the air we breathe; the food we eat; how much we smoke and exercise; our levels of stress, social support and feelings of isolation, to name just a few—also affect our health and well-being.

Life expectancy at birth in Canada is excellent, among the highest in the world. By 1997, it was about 79 years,[1] up from 59 years in the early 1920s and 69 years in the 1950s.[2] And compared with 20 years ago, older adults can (on average) look forward to a better quality, as well as a longer life.[3]

But not everyone has the same chances for a long and healthy life. For example, the life expectancy of women (81 years in 1996) was almost six years higher than for men. Significant gaps—over 10 years—also occur from region to region across the country.[1]

Differences also exist in how Canadians rate their own health. Just over six in ten Canadians aged 12 and older (61%) said that their health was very good or excellent on the 2000/2001 Canadian Community Health Survey. Who was more likely to be in this group? According to the survey:

- Younger compared to older people.
- People with higher incomes and education levels.
- People without chronic conditions compared to people with at least one.

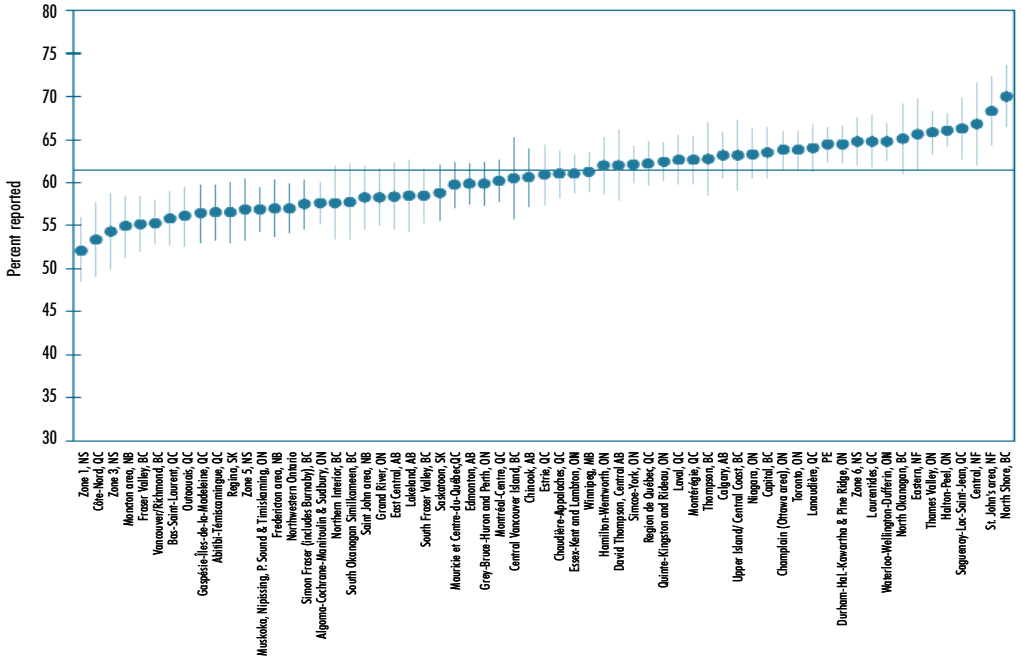
For anyone under 30, Canada before Medicare is history—something learned about secondhand from grandparents' stories, history books, or TV documentaries. Almost four in ten Canadians were born after 1972 when the last of the provinces and territories joined the series of insurance plans that cover most hospital and physician services.

Today, all jurisdictions administer interlocking publicly funded insurance plans guided by common pan-Canadian principles. The federal government is directly responsible for some healthcare services for specific groups. These include the Royal Canadian Mounted Police, members of the armed forces, veterans, status Indians and Inuit, and inmates in federal jails.

Other types of health care are funded through a complex mix of public funding, private insurance, and out-of-pocket payments. Examples include drugs, home care, nursing homes, dental care, physiotherapy, and alternative therapies.

What Canadians Say About Their Health 5

Most Canadians (61%) rated their health as very good or excellent on the 2000/2001 Canadian Community Health Survey. Many health regions had rates that were about the same as the national average (shown by the solid line on the chart below). But some had significantly lower or higher rates. The regional rates (shown by the circles) are estimated to be accurate to within the range shown by the bars 19 times out of 20. Results for all regions across the country are available in *Health Indicators 2002*, an insert in the back of this report.



Source: Canadian Community Health Survey, Statistics Canada

Medicare—and Other Care—Today

The web of healthcare services touches Canadians at home, work, and school; in physicians' offices, pharmacies, community health centres, hospitals, and nursing homes; and in many other places. Ideally, this complex network of healthcare providers and organizations should work together to provide high quality care, where and when needed, across the land.

In 2000/2001, most Canadians (78% of those aged 12 and older) reported that they had consulted a family doctor at least once in the last year. Many also sought care from other health professionals. Consultations with dentists/orthodontists (60%), eye specialists (38%), and other medical doctors (28%) were among the most common.

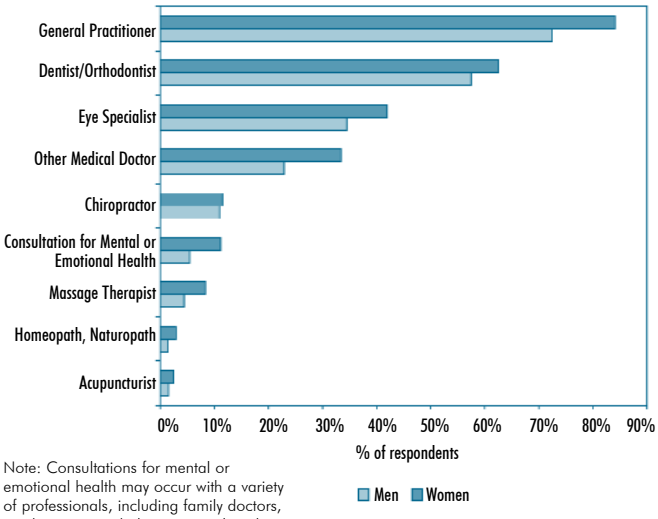
Many Canadians also visit healthcare institutions in the course of a year. These institutions come in all sizes and shapes—from large teaching hospitals to rehabilitation centres, chronic care facilities, nursing homes, and outpost nursing stations.

Most hospitals offer short-term diagnostic and treatment services for patients with a wide range of illnesses and injuries. Some also have separate groups of beds, wings, or buildings devoted to long-term care. Other hospitals specialize in treating particular groups of patients, such as children, mothers giving birth, and patients with cancer or psychiatric conditions.

Overnight stays in hospital have become less common in recent years, but day surgery programs are growing. Canadians spent almost 21 million days as inpatients

Seeking Care 6

Most Canadians aged 12 and older (78%) said that they had consulted a general practitioner at least once in the year prior to the 2000/2001 Canadian Community Health Survey. The graph below shows the proportion who reported having consulted selected types of health care providers, including complementary and alternative practitioners.

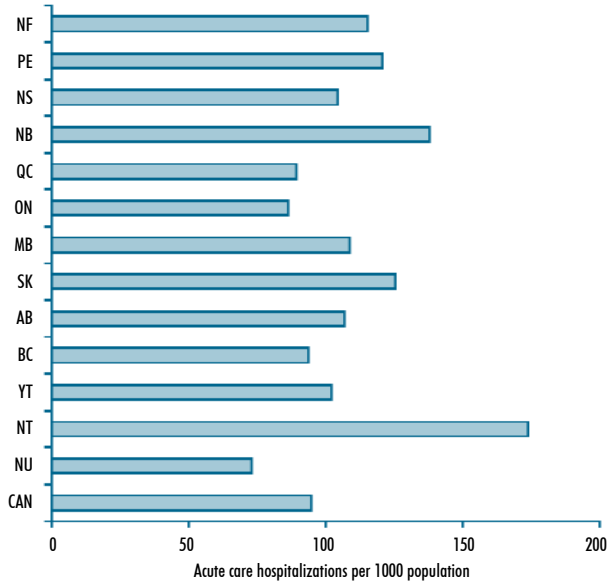


Note: Consultations for mental or emotional health may occur with a variety of professionals, including family doctors, psychiatrists, psychologists, social workers, and counselors.

Source: Canadian Community Health Survey, Statistics Canada

Stays In Hospital 7

Canada's acute hospitals discharged 2.9 million in-patients in 1999/2000 (excludes newborns and patients in other types of care such as emergency wards, chronic care and rehabilitation units, and day surgery programs). Age standardized rates of hospitalization—based on where the treatment occurred, not where the patient lived—varied across the country, as shown below.



Source: Hospital Morbidity Database, CIHI

in acute care hospitals in 1999/2000, down 15.6% from 1994/1995. Heart disease and stroke (15% of hospitalizations), pregnancy and childbirth (14%), and digestive diseases (11%) were the three leading causes of inpatient hospitalization in 1999/2000. In contrast, more and more patients received day surgery over this five-year period. For example, the number of day surgeries grew by 18% in Ontario.[4]

Most Canadians were hospitalized in the health region where they lived. The likelihood of an inpatient acute hospital stay close to home in 1999/2000 varied depending on what care you needed and where you lived. For example, patients who received relatively common types of surgery, like a hysterectomy, were less likely to leave their health region than were patients who had more specialized procedures, like bypass surgery. *Health Indicators 2002* (located at the back of this report) includes inflow/outflow ratios for each of Canada's largest health regions.

Choosing Other Options

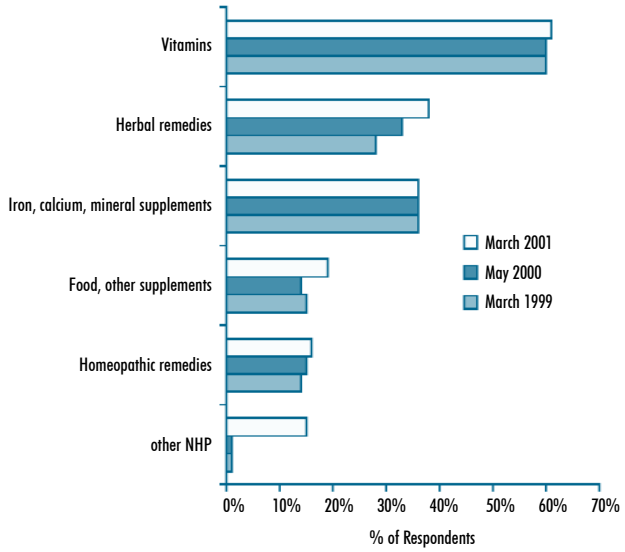
More and more Canadians are using massage therapy, traditional Aboriginal and Chinese medicine, homeopathy, herbal products, and other healing practices and products in addition to, or instead of, conventional medical treatment. In 2000/2001, about 4.9 million Canadians aged 12 and older (19%) reported seeing a chiropractor or another type of complementary or alternative health care provider in the previous year. That is up from 14% in 1994/1995.

Who is most likely to consult with complementary and alternative health practitioners? According to the Canadian Community Health Survey:

- Women (21% versus 17% for men)
- Canadians in mid-life (23% of those aged 25 to 54 compared with 14% aged 12-24 and 16% aged 55 and older)
- Those with one or more chronic conditions (23% versus 13% of others)
- Canadians with more education or higher incomes

Using Natural Health Products 8

More than 7 in 10 of Canadians reported using one or more natural health products (NHP) in the past six months in March 2001. The rates for selected types of products shown below are estimated to be accurate to within 2 percentage points, 19 times out of 20.



Source: Berger E. (2001). The Berger Population Health Monitor. Toronto.

Caring for Ourselves and Our Families

Professionals play important roles in promoting health and caring for the sick. So do individual Canadians. The 2000/2001 Canadian Community Health Survey asked Canadians in most parts of the country (excluding Quebec, Manitoba, and Nova Scotia) what, if anything, they had done in the past year to improve their health.

About half (54% of those aged 12 and older) said that they had taken action. Increasing physical activity was the most common step taken (57%). Weight loss was next (13%), followed by changes in diet or eating habits (12%) and quitting or reducing smoking (7%). About 4% said that the change they made was to seek medical treatment. Younger people, those with more education and higher incomes, and women were more likely to report having made a change.

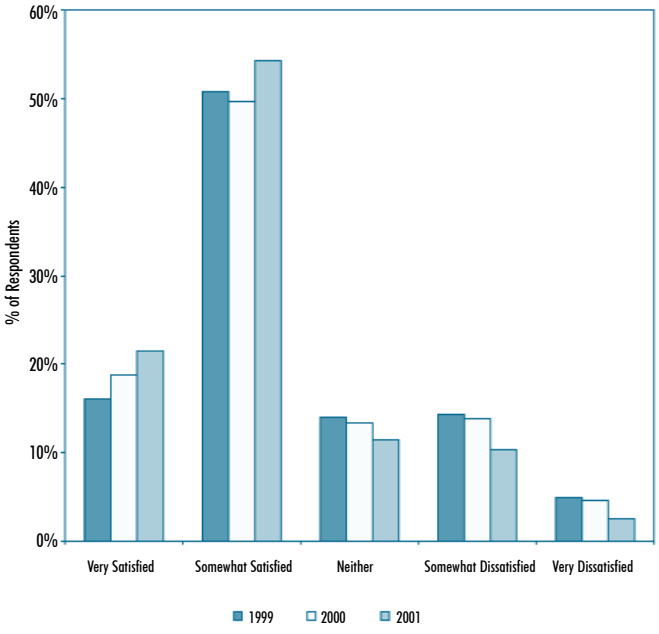
Many adult Canadians—about one in four in 2000—also reported providing some form of care to someone inside or outside their home.[5] The proportion of Canadians providing care and the types of care they gave differed by age, sex, and other factors. For example, 32% of Canadians aged 45-64 years reported providing informal care.

What Canadians Think…

What do Canadians think about the care they receive and the system as a whole? A recent review commissioned by CIHI found that some type of patient or public satisfaction measurement is underway in most parts of the country. Many health regions and hospitals, for example, conduct patient satisfaction surveys.

Satisfaction with the Alberta Health Care System 9

In 2001, three out of four Alberta residents (76%) said that they were "very satisfied" or "somewhat satisfied" with the health care system in Alberta. According to the report, men tended to have higher levels of satisfaction than women did.



Source: Northcott HC. (2001). *The 2001 Survey About Health and the Health System in Alberta*. Alberta: University of Alberta, Population Research Laboratory.

Different groups also periodically conduct broad-based polls of the general public. As part of the response to an agreement by premiers and the prime minister in 2000, Statistics Canada recently asked Canadians across the country about their satisfaction with care. Results will be available in the fall of 2002.

Across the many surveys and projects, some findings are consistent; others differ. Clearly, measuring satisfaction with healthcare is complex. In part, that is because a wide range of factors, including the measurement tools used, can affect how people rate health care. For example, how and what questions are asked may affect peoples' opinions. Different types of people also tend to respond differently, even when asked exactly the same questions. For example, in a recent Ontario report, seniors gave the highest satisfaction ratings for hospital care. Men were also more likely than women to give higher satisfaction ratings for such things as process quality, global quality, and housekeeping. In addition, many surveys find that respondents give higher ratings to the care they or their families received than to the healthcare system in general.

Untangling the Evidence—Satisfaction with Care and Services 10

The results of studies of satisfaction with health care and services are sometimes difficult to interpret, partly because of variations in the methods and data sources used. The table below outlines some of the key differences between selected recent Canadian satisfaction studies. (Note that, in most cases, even where the underlying concept being measured—such as overall satisfaction with the healthcare system—was the same, questions or populations surveyed differed, making comparisons difficult.)

Source	Coverage	General finding(s)	Time period
Ontario	Survey of acute care patients hospitalized overnight for general medical or surgical care	88% said that overall the quality of their care was excellent or good; 87% would return to the same hospital; 82% would recommend it to others. Scores for individual hospitals and specific attributes of satisfaction varied somewhat.	Oct. – Dec. 2000
	Survey of patients who used emergency departments (ED)	Mean scores out of 100 were 86 for bedside care, 85 for willingness to return to ED, 84 for satisfaction with ED staff, 82 for physician and medical treatment, 78 for waiting time, 77 for satisfaction with facility, and 75 for preparation for discharge.	Fall 2000
Saskatchewan	Survey of those who had received care in the last year (or whose immediate family had gotten care)	85% rated health system overall excellent or good.	2001
	Survey of general population in last year	65% rated the quality of the health system overall as excellent or good.	2001
Alberta	Survey of general public	88% very or somewhat satisfied with health care services most recently received in 2001.	1998-2001
Berger Population Health Monitor (National)	Survey of people who received care in the last year	Overall, 80% rated care received in the last year as very good or excellent. Trends in satisfaction varied across the country.	March 2001

Source: Compiled by CIHI

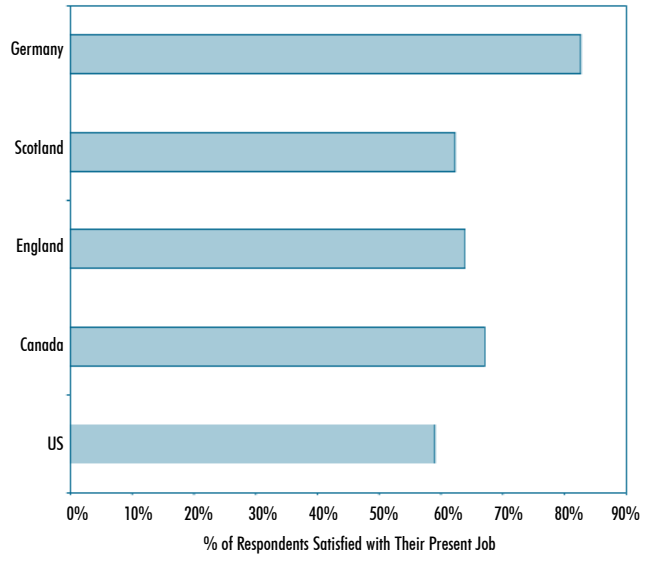
What Nurses Think

Measuring how satisfied healthcare professionals are with their jobs is as complex as tracking patient satisfaction with care. Once again, many factors are involved and how you measure satisfaction levels can affect results.

New research suggests that nurses who report being satisfied with their jobs also feel that they are providing better care.[6] The study also found that nurses who felt that a lower quality of care was being provided were more likely to report higher levels of job pressure, job threat, and role tension.

Job Satisfaction of Hospital Nurses: An International Perspective Heart Surgery 11

A 1998/1999 survey of RNs in five countries found that most were satisfied with their present jobs. But levels of satisfaction varied from country to country, as shown below. Note: the Canadian sample included nurses from Alberta, British Columbia, and Ontario only. The United States sample included only nurses from Pennsylvania.



Source: Aiken LH, Clarke SP, Sloane DM, Sochalski JA, Busse R, Clarke H, Giovannetti P, Hunt J, Rafferty AM, Shamian J. (2001). Nurses' reports on hospital care in five countries. *Health Affairs*, 20(3).

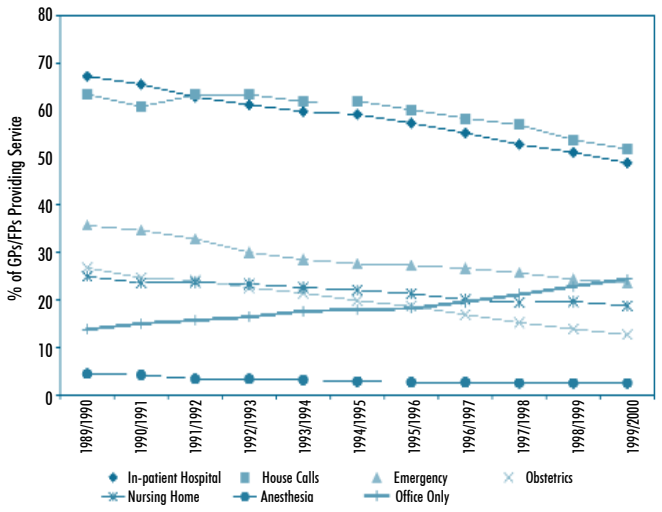
…About Access to Care

In addition to overall measures of satisfaction, researchers often ask more focused questions. Several recent surveys have explored what Canadians think about their access to care.

In 2000/2001, Statistics Canada asked adult Canadians (aged 12 and older) whether, in the past year, there was ever a time when they felt that they needed health care but didn't receive it. Most said no, but about 3.2 million adults (13%) agreed. This compares to 6% in 1998/1999. Of the 13%, half (50%) said that their reasons related to the availability of care, including long wait times. Other reasons included being too busy, transportation problems, not knowing where to go, or deciding not to seek care. Seven percent of those reporting perceived unmet needs chose to do without health care. Their reasons included competing demands on their time, attitudes towards illness, and issues related to health care providers or the healthcare system.

Declining Comprehensive Primary Care 12

In Ontario, the proportion of "office-only" general practitioners and family physicians rose from 14% to 24% between 1989/1990 and 1999/2000. These "office-only" physicians tended to be females, recent graduates, physicians aged 65 years and older, and those practicing in a city with a medical school. "Office only" physicians were less likely to be rural physicians or those certified in family medicine.



Source: Chan BT. (2002). The declining comprehensiveness of primary care. *Canadian Medical Association Journal*, 166(4), 429-34.

Provincial surveys have asked similar questions. For example, about 65% of Albertans said that access to care was easy or very easy in 2001, almost unchanged from 2000.[7] Researchers also asked which services were most difficult to access. For those reporting difficulty, just over 12% indicated hospital admission and surgery (about the same as in 2000); almost 47% said general practitioners (up from 41% in 2000); and 35% said medical specialists. In general, people with higher perceived levels of need were more likely to report difficulties in accessing services.

Just over 11% of Albertans surveyed said that they had personally been unable to obtain healthcare services when needed in 2001. Of these individuals, almost a quarter (22%) reported never getting the service. Why? Thirty-nine percent said that it was because wait times were too long; 26% said that they could not get an appointment to see a health professional; and 7% said that the services were not available nearby or were not conveniently located.

Watching the Clock: Wait Times in Health Care

In some cases, a delay of minutes counts. For example, a patient who is bleeding severely needs emergency care. Similarly, research suggests that there is a short window of time within which patients with acute ischemic strokes benefit most from thrombolytic (clot-busting) therapy. But often, waiting is not immediately life threatening. Determining medically safe waiting periods is difficult; so is judging the impact of anxiety, missed work, pain, or other consequences that a patient may experience while waiting.

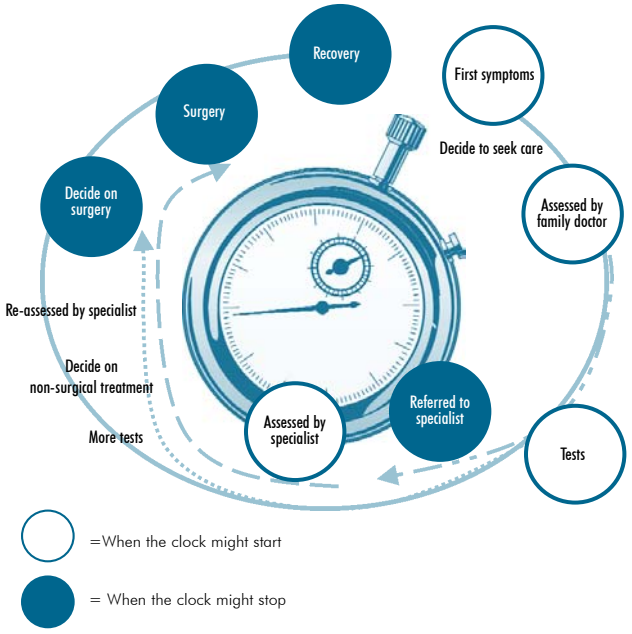
Wait times are affected by many factors. Examples include individual characteristics such as the severity of illness, the urgency of need, and the expected benefits of treatment.[8] Others are broader system factors: the availability of doctors, other health professionals, and health care resources (e.g. operating time); referral patterns; and where a patient is to be treated can affect wait times. The number

When Do Waiting Times Begin?

One of the main challenges in comparing wait times is deciding what 'wait time' means. Should a wait be calculated from when someone first experiences pain or other symptoms? From when he/she first visits a family doctor? From when test results confirm the need for further treatment? From some other point? There are advantages and disadvantages to each approach. And the choice made can affect results.

When is a Waiting Time Really a Waiting Time? 13

One of the reasons that it is so hard to compare data from across the country, is that there are many possible ways to define wait times. No one decision is "correct." But these differences must be understood if meaningful comparisons are to be made. The figure below shows a possible care path, with a variety of options for calculating wait times.



of factors potentially involved means that it is often hard to disentangle just what caused which parts of someone's wait for care.[9]

Comparable data about who is waiting for what, for how long, and the factors that influence waiting are scarce. Different groups monitor wait times in different ways. Some ask patients who received treatment in a given period how long they waited for care. Information on observed patient experience can also be collected directly from medical records or specialized monitoring systems.

An alternative approach is to survey doctors and ask them how long they expect that a patient would wait for a particular type of care. A review by the Canadian Health Services Research Foundation (CHSRF)[10] suggests that this approach may best measure care providers' satisfaction with access times.

Comparisons between approaches are difficult because of the differences in definitions used. For many areas where reasonably close comparisons are possible, wait times reported using the first approach appear to be shorter than those based on the second.

Untangling the Evidence—Wait Times 14

The results of wait time studies seem contradictory, partly because of variations in the methods and data sources used. The table below outlines some of the key differences between selected recent Canadian wait list studies and registry information. In addition, while most studies using administrative data include all patients who received care, coverage for physician surveys varies. For example, only about one quarter of doctors contacted by the Fraser Institute in 2001 responded to the survey.

	Study	Data source/ Coverage	General finding	Wait(s) measured	Time period
Based on Patient Experience	New Brunswick	Regional Hospital Corporation surgical wait lists	5.5% more cases waiting at end of March 1999 vs. 1998	# patients waiting, not wait times	March 1996-99
	NB, NS & Ontario data from Discharge Abstract Database	Actual patient experience reported by hospitals	Waits fluctuate throughout the year and are longest in the winter	Time spent in ER after health professional determined patient should be admitted	March 2000-April 2001
	Cardiac Care Network of Ontario	Actual patient experience reported by hospitals	Regional differences, but in all areas urgent/emergent patients have much shorter waits than elective patients	Surgery booking to surgery	November 2001-January 2002
	Manitoba Centre for Health Policy	Actual patient experience based on physician fee for service claims	Little change in 5-year period, stable or decreased for six of eight procedures.	From last pre-operative visit with surgeon to surgery date	1992/93 to 1996/97
	Alberta Health & Wellness Performance Indicators	Regional Health Authorities (joint replacement); Alberta Cancer Board	Waits vary across regions, with some below and others above provincial targets	Prescription to first treatment for radiation and chemotherapy; decision or booking of surgery to surgery for joint replacement	Quarterly Reports 2001
	B.C. Surgical Wait List Registryó Provincial Trends	Actual patient experience reported by hospitals	Waits have fluctuated up and down over the last 5 years; waits for some types of care were up, others down in most recent 6 months	Surgery booking to surgery	June 1995 ñ June 2001
Physician Surveys	Fraser Institute	Survey of physician opinion on reasonable waits	Actual waits were often longer than respondents considered reasonable in 2000-2001 in most parts of Canada	GP visit to specialist, specialist to treatment	1991-2001
	Commonwealth Fund Survey of Physicians	Survey of physician opinion on expected waits	Expected hip replacement waits shorter in Canada than in Australia, New Zealand, and the UK, but longer than in the US	Not specified	April ñ July 2000

Source: Compiled by CIHI

A Sample of What's Tracked

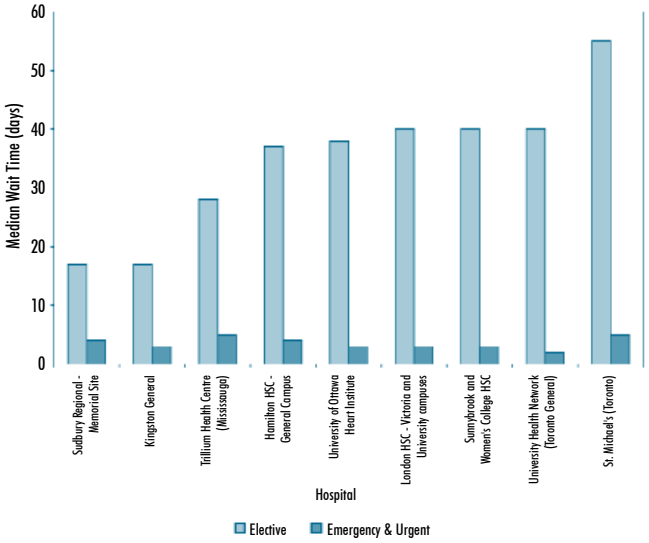
Across the country, there are growing pockets of information about who is waiting for what and for how long. We have profiled many of these efforts in previous reports, but new initiatives continue to emerge. This year, we again highlight a sample of wait time information available from recent or on-going monitoring programs.

For example, a recent study in **Quebec** tracked changes in wait times from first diagnostic procedure to breast cancer surgery between 1992 and 1998. Researchers found that median wait times increased substantially over this period, from 29 to 42 days. This was true even after adjusting for differences in age and cancer stage at diagnosis. Researchers found that the two most important factors contributing to wait times were the number of diagnostic procedures before surgery and the stage of the cancer at diagnosis.[11]

Ontario researchers are also tracking cancer wait times.[12] They looked at waits experienced by breast, gynecologic, colorectal, head and neck, thoracic, and urologic cancer patients selected over a four-month period and treated by surgeons affiliated with regional cancer centres. Researchers found that wait times varied by cancer type, but not substantially by the age of the patient.

Ontario Wait Times for Open Heart Surgery 15

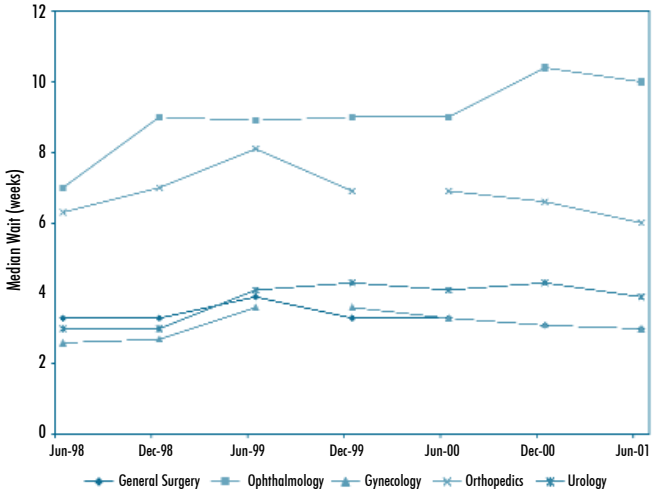
Wait times for open heart surgery vary across Ontario. In 2000/2001, at St. Michael's Hospital the median wait time-the point at which half of all patients had longer waits and half had shorter waits-was 55 days for elective open heart surgery. That compares to 17 days at Sudbury Regional and at Kingston General. Across all hospitals, emergency and urgent patients had a median wait of 2-5 days. Across Ontario, the median wait time for elective open-heart surgery was 38 days in 2000/2001; for urgent surgery it was 3 days.



Source: Cardiac Care Network of Ontario. (2002). Patient Access to Care. www.ccn.on.ca/access/waittimes.html

Surgical Wait Times in British Columbia 16

British Columbia maintains a computerized registry documenting surgical volumes and wait times reported by hospitals. This database covers 95% of all of surgeries booked by referring physicians in British Columbia. Wait times are calculated from the booking date to the surgery date for all surgeries performed in the three months prior to reporting date. Ophthalmology and orthopedic surgery have the longest median wait times; general and gynecology surgeries have the shortest.



Source: BC Surgical Wait List Registry (2001). Provincial Trends. www.healthservices.gov.bc.ca/waitlist/provdata.html

In the Emergency Department

Crowded emergency departments (EDs) continued to make the headlines in several parts of the country in the past year. How busy an ED is depends on how many people come to the ED, how sick they are, what happens in the emergency department, how many beds are available in the hospital, what other types of care are available in their community, and other factors.

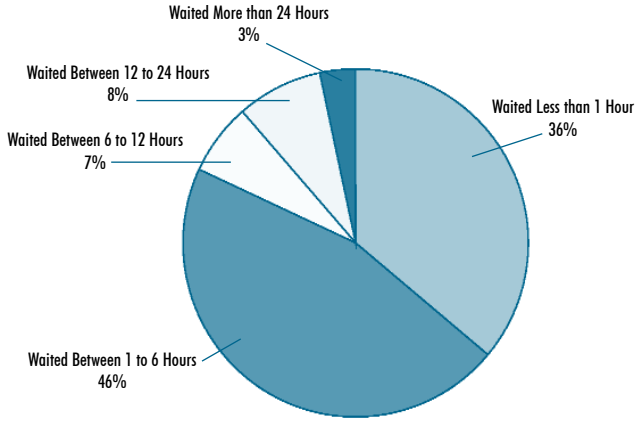
A 1999 poll[13] asked Canadians who had visited an emergency department in the last six months how long they waited before seeing a physician. Almost half (49%) said that they had waited less than an hour. In contrast, 9% waited more than four hours; and 1% left before seeing a physician. Older patients (65% of those 55 years and older) were more likely to report seeing a physician within an hour.

Another side of the story is presented when individuals are asked how they felt about their wait in the emergency department. A recent survey of Ontario patients[14] found that 78% of those polled said they were satisfied with the amount of time they waited in order to receive treatment.

Most patients who come to the ED go home after they receive care, but others need to be admitted to an inpatient bed. Hospitals in several provinces now track how long patients wait in the emergency department after a health professional decides that they need to be admitted. The median wait time for three Canadian provinces, (Nova Scotia, New Brunswick, and Ontario) was 90 minutes in 2000/2001.

Waiting for a Bed 17

How long do people wait in an emergency room once it has been determined they should be admitted to hospital? For 2000/2001, comprehensive data are available for 3 provinces (New Brunswick, Nova Scotia, and Ontario). Over 80% of patients waited under 6 hours for a bed. Only 3% waited longer than 24 hours. In general, wait times were longer in the winter months.



Source: Discharge Abstract Database, CIHI

Information Gaps—Some Examples

What We Know

- Life expectancy in Canada is among the best in the world, but there are important differences among regions of the country and population groups.
- Most Canadians report having consulted a family doctor in the last year. Many also use a mix of other healthcare services. The number of Canadians consulting complementary and alternative care providers appears to be increasing.
- Public confidence in Canada's healthcare system varies across the country. In many surveys, respondents report being more satisfied with the services that they personally received than with health services in general. Most Canadians rate the care they have recently received as excellent or very good, although trends differ across the country.
- There are pockets of information on wait times for different types of care across the country.

What We Don't Know

- What types of services do hospital emergency departments and outpatient clinics provide? How well is the changing mix of hospital services meeting community needs?
- How does patient satisfaction with hospital care and other types of services compare across the country? What factors explain higher and lower satisfaction levels?
- How do wait times compare across the country? What percentage of wait times fall within recommended guidelines for different treatments? What is the emotional and physical impact of waiting for different types of care?

What's Happening

- The recent Canadian Community Health Survey offers a wealth of new information about the types of care that Canadians in different parts of the country report receiving.
- Canada's premiers and the prime minister agreed to track and report on patient satisfaction and wait times, along with 12 other indicator areas, in each of their jurisdictions by 2002.
- The pockets of wait time data are expanding. For example, Saskatchewan Health is developing a provincial waiting list information system that will cover approximately 93% of the surgeries done in the province.[15] At a pan-Canadian level, CIHI launched the Canadian Joint Replacement Registry in 2000 in collaboration with orthopedic surgeons from across the country. As part of this project, partners are working towards collecting comparable wait times for total hip and knee replacements.
- The Western Canada Waiting List Project brought together major stakeholders in 1999 to develop reliable, valid, practical, and clinically transparent tools to prioritize patients waiting for cataract surgery, children's mental health services, general surgery, hip and knee replacement, and MRI scans.[16] A report on the project's results was issued in March 2001. The Ontario Waiting List Project is also evaluating some of these tools.[17]

For More Information

[1] Statistics Canada. (2001). *Health Indicators: Life Expectancy.* Ottawa: Statistics Canada. http://www.statcan.ca/english/freepub/82-221-IE/01201/hlthstatus/deaths.htm#life
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[8] Hadorn DC and the Steering Committee of the Western Canada Waiting List Project. (2000). Setting priorities for waiting lists: Defining our terms. *Canadian Medical Association Journal*, 163(7), 857-60.
[9] Olivotto IA, Bancej C, Coel V, Snider J, McAuley R, Irvine B, Kan L, Mirsky D, Sabine MJ, McGilly R, Caines JS. (2001). Waiting times from abnormal breast screen to diagnosis in 7 Canadian provinces. *Canadian Medical Association Journal,* 165(3), 277-83.
[10] Canadian Health Services Research Foundation (CHSRF). (1998). *Quid Novi?* 1(4). Ottawa: CHSRF.
[11] Mayo NE, Scott SC, Shen N, Hanley J, Goldberg MS, MacDonald N. (2001). Waiting time for breast cancer surgery in Quebec. *Canadian Medical Association Journal*, 164(8), 1133-8.
[12] Simunovic M, Gagliardi A, McCready D, Coates A, Levine M, DePetrillo D. (2001). A snapshot of waiting times for cancer surgery provided by surgeons affiliated with regional cancer centres in Ontario. *Canadian Medical Association Journal*, 165(4), 421-5.
[13] Berger E. (2001). *The Berger Population Health Monitor*. Toronto: The Hay Group.
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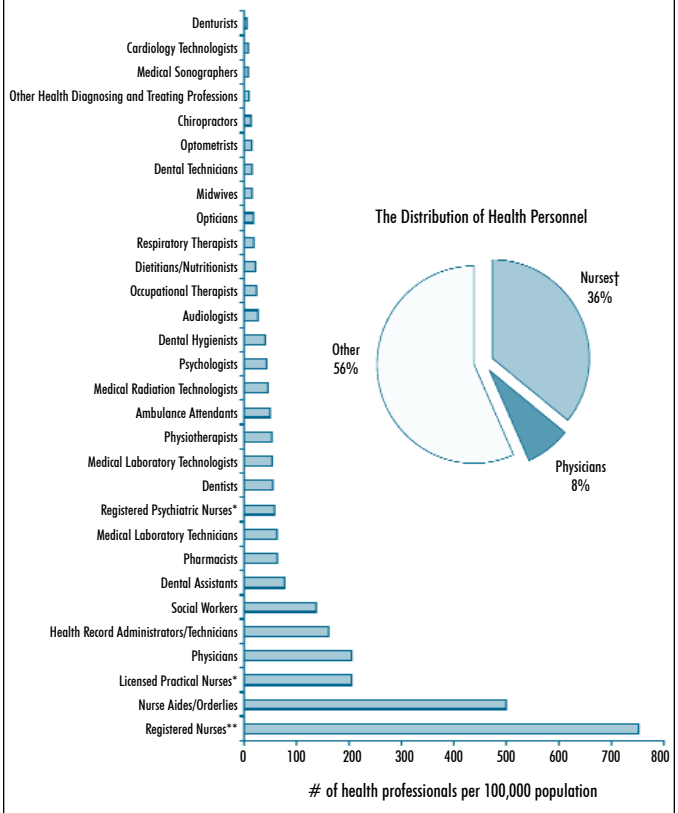
[15] Saskatchewan Health. (2000). *Saskatchewan Health Annual Report 2000-01.* www.health.gov.sk.ca/Report.pdf
[16] Western Canada Waiting List Project. (2001). *From Chaos to Order: Making Sense of Waiting Lists in Canada.* www.wcwl.org
[17] Ontario Joint Policy and Planning Committee. (2000, November 10). *Ontario Waiting List Project Launched.* www.jppc.org/owl/news_rel1.htm

3. The People, the Cost, the Information

Health care is a large, resource-intensive industry. More than 1.5 million Canadians worked in health care and social services in 2000. And we now spend over $102 billion dollars per year on health services (2001 forecast). This chapter explores the human, financial, and information resources used to deliver care to Canadians across the country.

Canada's Health Care Professionals 18

Together, registered nurses (RNs), licensed practical nurses (LPNs), and registered psychiatric nurses (RPNs) account for more than one-third of all health care workers. The rest come from a wide variety of occupations. The chart below shows the number of health professionals per 100,000 Canadians in 2000 for selected occupations.



Notes: Registered Psychiatric Nurses are only registered in British Columbia, Alberta, Saskatchewan, and Manitoba; therefore the ratio for this group is calculated using the population of these four provinces only.
† Includes RNs, LPNs, and RPNs

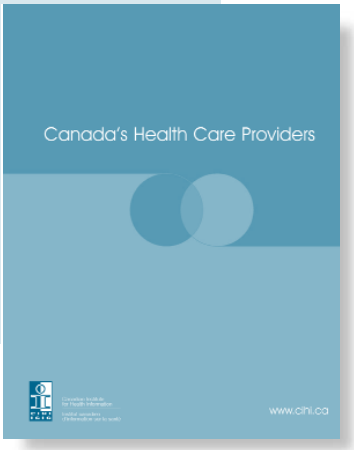
Sources: Labour Force Survey, Statistics Canada except where noted.
* Health Personnel Database, CIHI ** Registered Nurses Database, CIHI

The People

About one in ten employed Canadians worked in health care and social services in 2000.[1] Many provide care directly to patients. Others serve in support roles, teach, do research, manage health programs, or have other responsibilities. In addition, many more Canadians helped to care for friends and family members or volunteered with health care organizations.

There's More: Report on the People Who Work in Health Care in Canada

CIHI has recently released a special report that includes more in-depth information about Canada's health care providers. Information in this report covers the supply and distribution of health care providers, educational trends, migration, the composition and characteristics of the health care team, recruitment and retention issues, the health and worklife of health professionals, and much more. The report can be downloaded for free from www.cihi.ca.



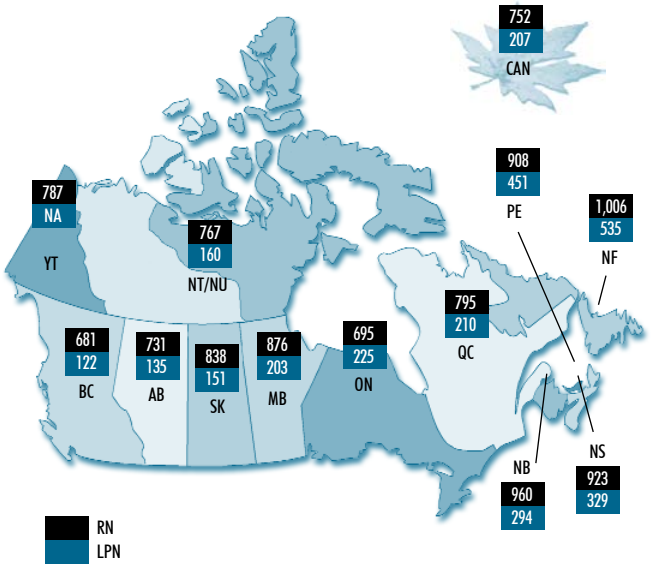
Canada's Nurses

Nursing is the largest health profession. Nurses work in a wide range of settings—including providing crisis care in busy emergency rooms, acute care on hospital wards, palliative care in long-term care facilities, and community care in homes. They may also assist new mothers in their homes or promote public health policies such as smoke-free public places. In addition, nurses do research in universities, work in home care, and much more. There are three regulated nursing groups: registered nurses (RNs), licensed practical nurses (LPNs)*, and registered psychiatric nurses (RPNs).

In 2000, more than 232,000 RNs worked in nursing in Canada. That's up more than 5 registered nurses per 100,000 Canadians from 1999, but down 35 per 100,000 population from 1995. Although most RNs (64% in 2000) still work in hospitals, the number employed in community health is gradually increasing. There were also more than 63,000 LPNs and 5,400 RPNs working in Canada in 2000. Registered psychiatric nurses are licensed only in the four western provinces.

Nurses Across the Country 19

In 2000, 752 registered nurses (RNs) per 100,000 Canadians were employed in nursing along with 207 licensed practical nurses (LPNs) per 100,000 Canadians. But nursing to population ratios varied across the country, as the map below shows.

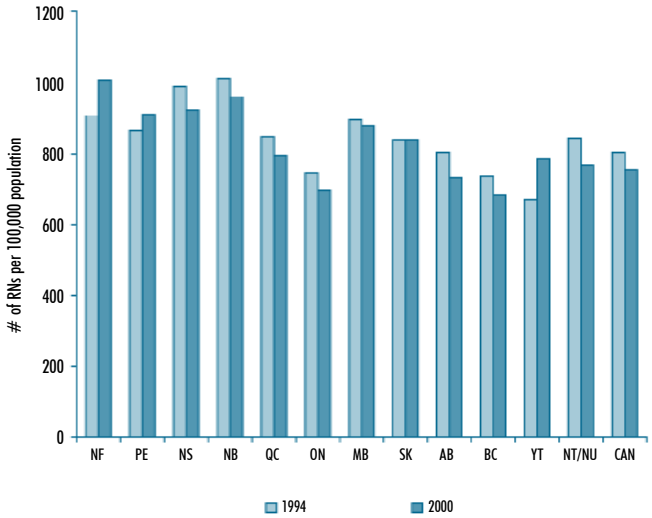


*Notes: Manitoba LPN data are estimated.
LPN data are not available from the Yukon.
RN and LPN data for Northwest Territories and Nunavut are not separated for the two territories. Accordingly, the same ratio (calculated using combined population figures) is reported for both jurisdictions.

Sources: Registered Nurses Database, CIHI; Health Personnel Database, CIHI

Trends in Nursing Supply 20

The number of registered nurses per 100,000 population fell in most parts of the country between 1994 and 2000. Exceptions were Newfoundland and Labrador, Prince Edward Island, and the Yukon (which saw ratios rise), as well as Saskatchewan (which saw little change over this period).



Source: Registered Nurses Database, CIHI

* Licensed practical nurses are also known as registered practical nurses and registered nursing assistants in different parts of the country.

Nursing in Rural and Small Town Canada

Canada's rural areas and small towns were home to about 22% of the total population in 2000, including about 18% of registered nurses employed in nursing. That's a total of 41,502 RNs or 623 per 100,000 population in rural Canada. In urban areas, the rate is 780 per 100,000 Canadians.

Between 1994 and 2000, population growth was accompanied by decreases in the number of RNs employed in nursing in urban and rural areas. As a result, the nurse to population ratio has declined in both types of regions.

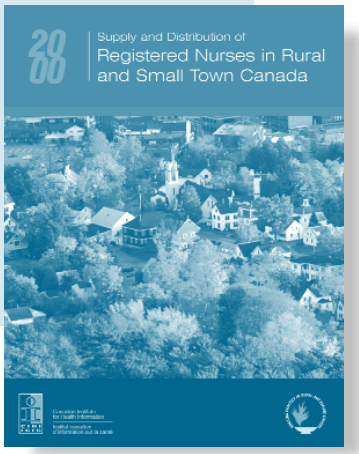
These ratios are useful starting points. But they do not fully explain variations in the supply of nursing services. Differences in geography and distance, the types of work that nurses do, practice patterns, and the context within which nurses work must also be taken into account. A new program of research is beginning to explore these factors, and many other issues.

Early results[2] suggest that, in general, RNs who live in rural and small town Canada share many characteristics with their city counterparts. For example, the RN workforce is aging; fewer than one in 20 RNs is male; the average level of RN education is rising; and most RNs provide direct patient care.

Within these overall trends, there are important differences from community to community. For instance, 22 rural communities are served by a sole RN, aged 60 or older. Another 93 have a single RN aged 50–59 years. In contrast, some rural communities have much younger nurses. A sole RN under the age of 30 is in place in 54 communities.

There are also some areas where trends differ between rural and urban areas. For example, RNs in rural and small town Canada are more likely to work for more than one employer. They are also more apt to have overlapping roles (e.g. management/administration and direct patient care). Migration patterns also differ. For instance, rural RNs are more likely to have stayed in the province where they were first trained than their urban colleagues. As for other types of immigrants, foreign-trained nurses tend to work in urban areas.

Watch for more results from the *Nursing Practice in Rural and Remote Canada Study Group* over the coming years.



Physician Trends

After nursing, medicine is the second largest regulated health profession. In 2000, CIHI counted more than 57,800 physicians in clinical and non-clinical practice in Canada, up 5.3% since 1996. During this period, the number of specialists grew more (7.4%) than did the number of family doctors (3.2%). As of 2000, specialists accounted for just under half of all physicians (49.6%).

Growth patterns differed across the country. Between 1996 and 2000, the Northwest Territories had the largest estimated increase in the number of physicians per 100,000 population (+25). Nova Scotia (+14), Saskatchewan (+10), Manitoba (+8), and Newfoundland (+7) also saw substantial growth. In Alberta†, Quebec, British Columbia, New Brunswick, and Prince Edward Island, the increases were smaller. While physician rates increased in the majority of the country, they were relatively stable in Ontario (-1) and fell in the Yukon (-10). Between 1999 and 2000 Nunavut also experienced a decrease (-15).

The absolute numbers of licensed physicians is one important factor in understanding physician supply. There are also many others. For example, many physicians perform duties other than clinical care, such as administration, teaching, and research. As a result, it is important to consider the number of physicians providing different types of services, not just the total number with licenses.

† Due to recently identified reporting issues this estimate was under review at the time of publication.

Other factors—such as gender, age, specialty, size of community, place of graduation, clinical demands, average workload, and personal characteristics—can also influence the "effective" physician supply. For instance, a recent report[3] found that 15-20% of physicians receiving fee-for-service payments for clinical services are "inactive" for at least 3 months of the fiscal year. This situation is more common among women physicians and those in rural areas.

Despite periods of inactivity, however, average physician workloads are increasing.[3] In fact, the workload of physicians—as measured by activity ratios—has increased since 1993/1994 in primary care, medical, and surgical specialties.

What's in an Activity Ratio

"Activity ratios" compare the relative amount of work two group of physicians do, as measured by fee-for-service activity, taking into account which provinces they practice in and their specialties. For example, a ratio of 1.0 represents what a "typical" full-time physician billed (technically, between the 40th and the 60th percentiles), adjusted for differences between provinces and specialties.[3]

Care Providers of the Future

Graduates from today's training programs are tomorrow's health care providers. The numbers and types of graduates will have substantial effects on the future of our health care system.

More women than men work in health care. The characteristics of students enrolled in university programs suggest that this pattern will continue. In 1998/1999, Statistics Canada reported that about 37,500 students were enrolled in full-time and part-time undergraduate health professional programs. Over three-quarters (76%) were women.[4]

Recently announced increases in enrolment for some health professional programs may swell these numbers in the coming years. For example, British Columbia plans to nearly double its enrolment capacity of first year medical students from 128 to 224 by 2005.[5] They are also planning to establish satellite medical schools in Prince George and Victoria for the new Northern and Island Medical Program. Last year, Ontario announced similar plans. They propose to admit 55 students to a new northern medical school with sites in Sudbury and Thunder Bay in 2004.[6] Current Ontario medical schools can also enroll 47 more students this year on top of 113 new placements offered in 2000 and 2001. Some postgraduate programs are also growing. For instance, to improve the focus on northern/rural practice, 25 new first-year postgraduate positions and 25 new third-year family medicine positions are now available.[7] Finally, the government is also opening the door for 15 Canadian citizens or landed immigrants who completed their training outside of Canada to undertake postgraduate training before starting to practise in Ontario.[8]

Medicine isn't the only growth area. For example, Prince Edward Island and Newfoundland and Labrador have added 14 and 32 new seats (respectively) for nursing studies.[9,10] Some educational institutions are also offering programs that allow nursing students to graduate sooner, by condensing studies for those with previous degrees or allowing students to fast-track by taking summer courses.

The Cost of Studying

Today's students are facing rising health education costs. Average annual tuition fees at Canadian universities have increased steadily in recent years.[11] That's true at both the undergraduate and graduate levels and for most types of programs. For example, the average annual tuition fees for dentistry programs rose from $5,425 to $8,491 (a 57% increase) between 1998/1999 and 2001/2002.[12] Over the same period, tuition for medical students increased 39%. In 2001/2002, their average tuition was $6,654.

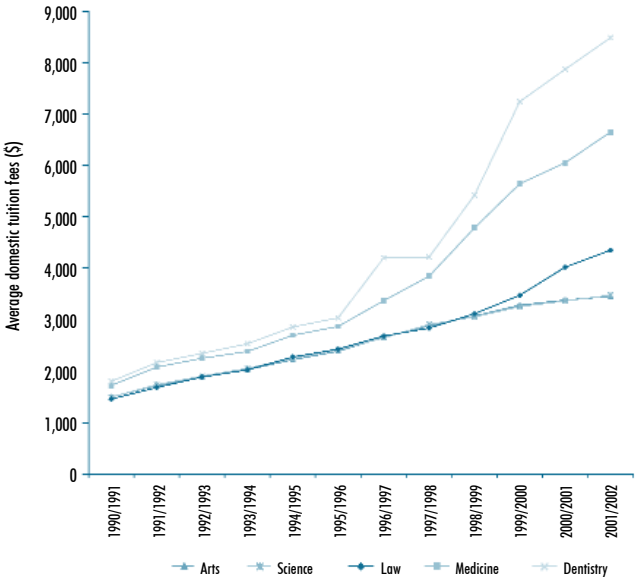
Use of student loans and debt levels are also rising. According to Statistics Canada's National Graduate Survey, 50% of new university health graduates[‡] in 1995 had government student loans, compared to 47% in 1986.[13] The median amount owed by university health grads also rose over this period, from almost $9,300 to $15,000, adjusted for inflation. So did the proportion of health grads turning to other funding sources, such as families, friends, and other financial institutions, to finance their education (from 18% in 1986 to 22% in 1995).

Different types of health graduates reported different levels and types of student debt. Nursing graduates were less likely to have borrowed money through government loans or other sources in 1995 than others were. In contrast, growth in use of funding sources other than student loans was higher for medical students[§] than for other health grads. In 1995, 48% reported their use, up from 27% in 1986.

A separate 2001 survey[14] found that first-year medical students in Ontario (where tuition has more than doubled since 1997) expected to have higher debt levels than did fourth-year students. First-years expected to owe a median of $80,000 at graduation compared with $57,000 for fourth-years.

Rising Tuition Costs 21

Medical and dental programs have higher average undergraduate tuition than other types of programs—and they have seen steeper increases since 1998/1999. The chart below shows average undergraduate tuition fees per year by program type. Using the most current enrolment data available, averages are weighted by the number of students enrolled at each university per program.



Note: Average values shown above are not adjusted for inflation. Between 1990 and 2001, the Consumer Price Index increased by 25%.

Sources: Tuition and Living Accommodation Costs Survey, Culture, Tourism, and the Centre for Education, Statistics Canada

Passing the Torch

Children born to poorer, less educated parents tend to have different education and career patterns than those from other families.[15,16,17,18] In the 1995 National Graduate Survey, more than half of all health graduates (52% from university and 65% from college programs) reported that their father had a high school education or less. Results were similar for maternal education. Parents of nursing grads were more likely to be in this group (approximately 65%) than those of medical school grads (approximately 39%).

A 2001 survey of first-year students in Canadian medical schools outside Quebec[19] found that respondents differed from the Canadian population as a whole in several ways. For instance, more were from visible minority groups, although some groups were over-represented and others were under-represented. Students were also less likely to come from rural areas (11% versus 22% of the population in general) and from families and neighbourhoods with low socioeconomic status. For example, they reported that 39% of their fathers and 19% of their mothers had a master's or doctoral degree. That compares with 6.6% of Canadian men aged 45 to 64 and 3% of women in this age group.

[‡] Only includes graduates that did not complete further post-secondary education prior to the interview.

[§] Includes graduates from the professional program, and the medical and surgical specialty programs.

They were also more likely to say that their financial situation would have a major influence on which specialty they would choose and where they would practice after graduation. Similar gaps were not found among students surveyed at Canadian medical schools outside of Ontario. (Quebec was not included in the study)

Managing Health Care in Canada

Most health professionals provide direct or indirect services to patients. Others organize the delivery of services. Who is managing our health system? Although comparatively little is known about these professionals and how their ranks are changing over time, pockets of information do exist.

For example, the University of Ottawa, the Canadian College of Health Services Executives and Caldwell Partners worked together on a national survey of Canada's health care CEOs in January 2000.[20] The survey asked executives to describe themselves, their recent career, and their perceptions of health system change.

Over 100 CEOs responded to the survey (response rate of 32%). The majority of respondents were

- between the ages of 45-54 (57%); fewer than two percent were under age 35 and fewer than 10% were over the age of 60
- male (87%)
- educated at the Master's degree level (71%)

Many CEOs reported job changes in recent years; 39% had been in their current role for three years or less. Another 20% had between three and five years tenure and just under a quarter (23%) had between five and 10 years.

CEOs of health organizations also frequently work with ministries of health and politicians. Again, relatively little is known about these groups except in pockets where special studies have been done.

Quebec's Health Care Managers

In 2001, Quebec's Ministry of Health and Social Services released a report that profiled the 9,593 managerial staff in the health network and outlined the challenges associated with their recruitment and retention.[21] The report anticipates that many health care managers will retire in the next ten years. At the same time, changes in the health care system may affect the demand for managers. The report calls for human resources transition planning since 23% of executives are approaching retirement age—almost double the rate for other management positions.

Health and Social Services Managers in Quebec 22

A recent report by Quebec's Ministry of Health and Social Services profiled the more than 9,500 middle, senior, and top managers in the province's health sector. The table below highlights some of their findings. For example, while almost two-thirds (63%) of middle managers are women, men hold almost eight in ten (78%) of the top positions.

Management Level	#	% of Total	% Male	Average Age	% ≥ 55 years
Top*	506	5%	78%	50.4	23%
Senior**	1,390	14%	57%	47.8	12%
Middle	7,697	80%	37%	46.5	9%
Total	9,593	100%	42%	46.9	10%

Notes :
* Includes Chief Executive Officers, Managing Directors, Assistant Managing Directors, Executive Advisors
** Includes Directors, Assistant Directors, Assistants to the Managing Director, etc.

Source: Ministère de la Santé et des Services Sociaux. (2001). *Planification de la main-d'oeuvre - Personnel cadre et hors-cadre du réseau de la santé et des services sociaux. Rapport du conseil d'administration du Centre de référence des directeurs généraux et des cadres*. Québec. MSSS.

Changes at the Top 23

Since 1990, 85 health ministers and 79 deputy ministers of health have served at the federal, provincial, or territorial level across the country. The table below shows the number of ministers and deputy ministers who held office in each jurisdiction between January 1990 and December 2001 and their median term (in months). The median is the point at which half served longer and half served shorter terms.

Jurisdiction	Ministers	Median Term	Deputy Ministers	Median Term
Federal	7	25.9	5	30.2
Newfoundland	6	28.7	4	16.7*
Prince Edward Island	5	29.6	8	13.0
Nova Scotia	6	27.4	8	21.2
New Brunswick	5	27.6	3	31.9*
Quebec	5	26.8	7	20.1
Ontario	8	17.4	6	22.8*
Manitoba	5	26.9	6	18.8
Saskatchewan	7	19.2	4	27.0*
Alberta	4	44.9	8	14.3*
British Columbia	11	8.0	9	13.8
Yukon Territories	5	21.3	3	44.4
Northwest Territories	10	9.1	5	27.3
Nunavut	1	Appointed April 1999	3	10.0

*Approximate value (the year of appointment is the only information available for some deputy ministers).

Source: Compiled by CIHI

Spending on Health Care

Canada's health care spending is higher than ever before. It passed the $100 billion mark for the first time in 2001. In total, we spent $102.5 billion (forecast) to improve or maintain our health, an average of about $3,300 per person.

After adjusting for inflation and population growth, total health care spending was up 4.3% from the year before. Annual increases in health care costs are the norm in Canada. We have seen steady growth over several decades, except for the mid-1990s.

Population growth and inflation partly explain this trend. But even after they are taken into account, spending in 2001 is expected to have been more than 80% higher than in 1975. And real health care spending per person on average rose faster over the last four years than in any period since Medicare was introduced.

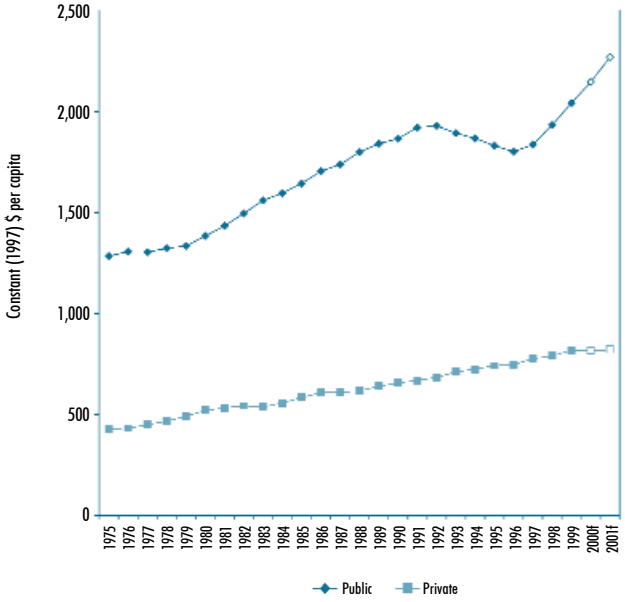
Dividing the Health Care Dollar: Who Pays?

Many groups share the cost of health care. The federal, provincial, territorial, and municipal governments, as well as social security programs, pay part of the cost. Just under $2,400 per person came from these public sector sources in 2001. That's about 73% of the total. The rest came from private sources, such as insurance companies and out-of-pocket payments.

Between 2000 and 2001, public sector spending grew faster than that from private sources. After adjusting for inflation and population growth, it was up about 5.7%, compared to 0.7% for the private sector. The increases continue recent trends. In 1997, just under 30% of health spending—the highest proportion seen over the last quarter century—came from the private sector. Each year since then, growth in spending from the public purse outpaced that from private sources. The reverse was true from 1992 to 1997.

Who Spends What on Health Care **24**

Canadians spent about $3298 per person on health care in 2001 (the equivalent of about $3089 in constant 1997 dollars). CIHI estimates that inflation-adjusted public sector health care spending per person increased by just under 6% compared to 2000. Private sector health care spending growth was lower—under 1%.



Note: Open symbols are forecast figures.

Source: National Health Expenditure Database, CIHI

How Canada Compares

Canada spends more of its economic output on health care than most countries. For example, we spent about 9.3% of GDP on health care in 1998. Only three OECD countries spent more—the United States (12.9%), Switzerland (10.4%), and Germany (10.3%).[22]

What about actual dollars spent on health care? In total, we spent more per person than 25 of the other 29 OECD countries in 1998, after adjusting for differences in exchange rates and prices. At an international level, higher spending is not necessarily tied to better health. For example, the United States consistently spends more on health care than Canada but has a lower life expectancy.

In all countries, the health care bill is divided between public and private sector payers. Although the public sector share in the United States (45% in 1998) is lower than in all other OECD countries, it

nonetheless reflects for high expenditure. For example, United States public sector spending per person on health in 1998 ($1,866 US) was higher than *total* public plus private spending in more than half of all OECD countries. Other OECD members spent between 46% (Korea) and 92% (Luxembourg) publicly. In US dollar terms adjusted for differences in purchasing power across countries, the range of public spending per person was $201 in Mexico to $2,087 in Switzerland. Canada came in at $1,655, higher than all but 7 other countries.

As in Canada, public health care spending in most countries has fluctuated in recent years. Some commentators suggest that unpredictable changes in spending from year to year may make it difficult for those responsible for delivering health services to plan appropriately.[23]

A Closer Look at Canada

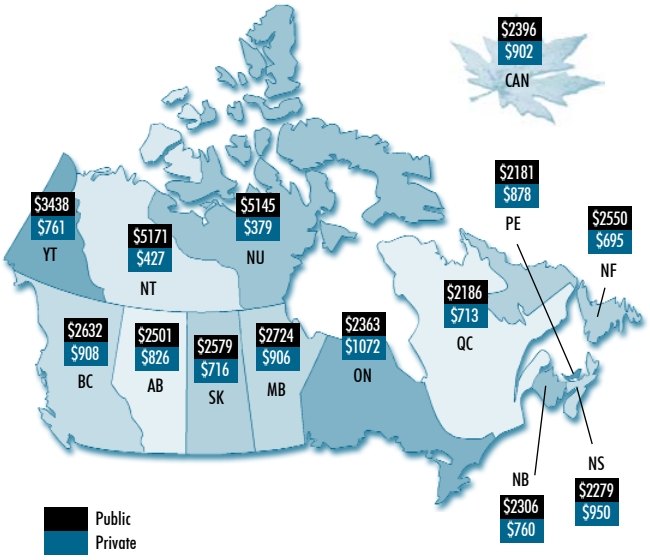
Within Canada, the health care bill varies from coast to coast. Among the provinces, total public and private spending per person ranged from about $2,899 in Quebec to $3,630 in Manitoba in 2001. As in previous years, per capita spending was highest—over $4,000—in the territories.

Why does health spending vary? Many factors—geography, health needs, how care is organized and delivered, and how much health professionals are paid, among others—can affect expenditures. For example, the territories serve relatively small populations scattered over large geographic areas. This partly explains their higher health expenditures. In 1999, for instance, 12% of their public health care dollars went to ambulance services. The provinces averaged less than 2%.

Differences in demographics can also affect health costs. Average expenditure is different for men and women, the young and the old. To better understand these effects, CIHI "standardizes" provincial/territorial government health care expenditures for differences in age and sex.[24] The results estimate what the government would have spent if its residents had the same age/sex profile as the country as a whole.

How Much We Spend 25

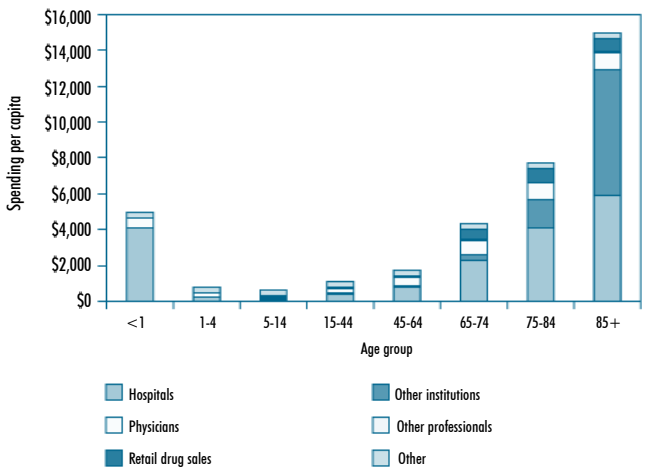
North to south, east to west, Canadians everywhere spend substantial amounts per person on health care. Overall, public sector health care spending per person averaged $2,396 in 2001 (forecast). Average private sector spending was $902 per Canadian.



Source: National Health Expenditure Database, CIHI

Where Government Health Dollars Go 26

The types of health care we need change over our lifetime. The chart below shows how much provincial/territorial governments spent per person on different types of health care by age group in 1999.

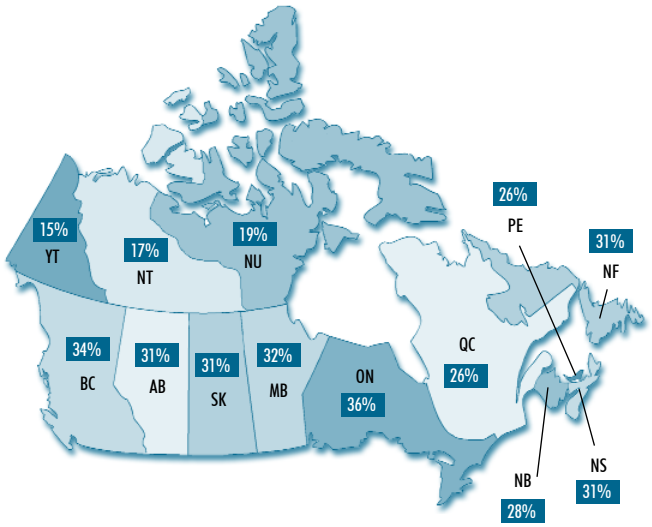


Source: National Health Expenditure Database, CIHI

In 1999, provincial government spending on health care ranged from $1,747 per person in Prince Edward Island to $2,194 in Newfoundland. That's a difference of almost 26%. The gap was even wider—almost 35%—after estimates were age/sex standardized. Why? On average, Newfoundland's population is younger than Canada's as a whole and Prince Edward Islanders are older. As is the case for the unadjusted figures, per capita standardized spending was highest in the Territories.

Health's Share of Government Dollars 27

Health care is only one of many programs that provincial and territorial governments fund each year. Its share of the total, however, is rising. It was almost a third (32%) of total expenditures including debt charges in 2000, up from 27% in 1975. The map below shows health care spending as a percentage of total provincial/territorial government expenditures for each jurisdiction in 2000.



Note: Direct health care expenditures by the federal government, which tend to be highest on a per capita basis in the territories, are not included. Total Provincial and Territorial Government includes expenditures by sovereign and non-sovereign bodies of provincial-territorial ministries, departments and agencies; autonomous boards, commissions and funds; and autonomous non-commercial non-profit education, health and social service agencies controlled by provincial-territorial governments.

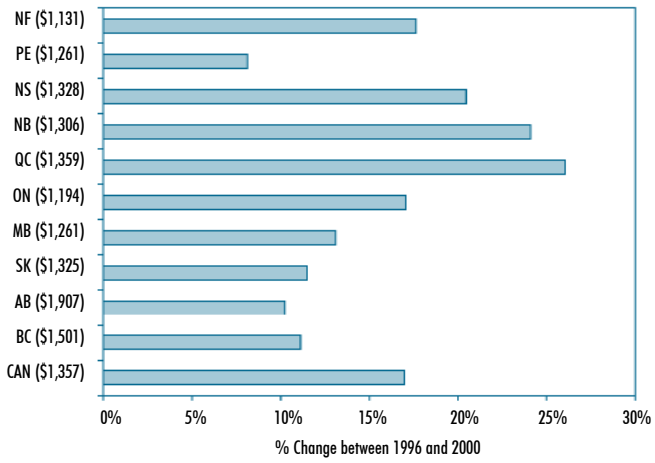
Source: National Health Expenditure Database, CIHI

As taxpayers, we contribute to public spending on health care. In addition, we pay health insurance premiums and out-of-pocket health care costs. These two categories account for the bulk of private spending on health care.

According to Statistics Canada's Survey of Household Spending**, Canadian households are spending more on health care than in the past. Average spending *per household* in 2000 was $1,357, up from $1,009 in 1996. The largest share was for health insurance premiums, followed by medicinal and pharmaceutical products and dental services.

How Household Health Care Spending is Changing 28

In 2000, Canadian households, on average, spent $1,357 on health care. That represents just over 3% of after-tax spending. Between 1996 and 2000, average household after-tax spending on health care rose in all provinces. The graph below compares the change in average household health care spending across the country over this period, adjusted for differences in age, sex, and household composition. In all cases, differences between 1996 and 2000 are statistically significant ($p<0.05$). The dollar value beside each province shows average household spending on health care in 2000.



Notes: Based on full-year households only.
Data from the territories are not available.
Due to differences in provincial health plans, average household spending may include provincial health care insurance premiums in some jurisdictions.

Source: Family Expenditure Survey, Statistics Canada (1996).
Survey of Household Spending, Statistics Canada (2000).

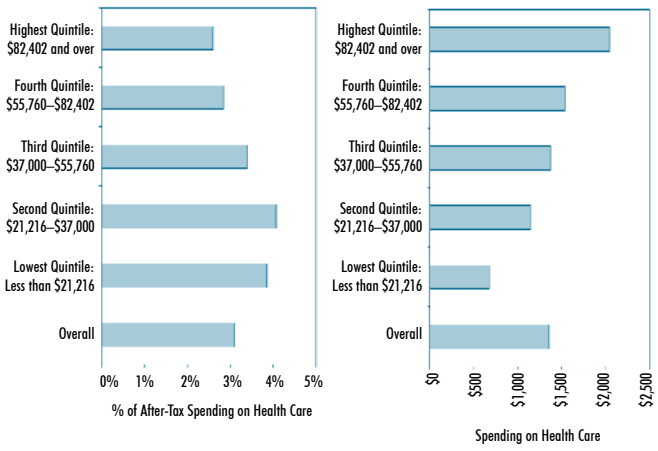
Spending patterns varied depending on age, sex, living arrangements, and other factors. For example, male seniors living alone in 1999 reported spending an average of $744 on health care. Their female counterparts said they spent more—an average of $873. In contrast, men under age 65 reported spending $594 in 1999. That compares with $840 for women in the same age group.[25]

** The Survey of Household Spending collects self-reported data on household expenditure. Average spending *per household* is higher than the average *per person* numbers reported above from CIHI's National Health Expenditure Database.

Health care spending also differed by household income. To see how, we divided households into five groups of equal size (called "quintiles") based on their annual income. The highest income group spent more than three times as much on health care as the lowest income households, adjusted for household size. But the low-income group spent a larger share of its after tax-income on health care in 2000 (3.9% versus 2.6%). Across all households, 3.1% of after-tax income went to health care, up from 2.3% in 1978.[26]

The Difference Income Makes 29

High-income and low-income Canadian households tend to have different spending patterns. That's as true for health care as for other goods and services. In 2000, households with incomes of $21,216-$37,000 (the second quintile) had the highest percentage of after-tax spending on health care, after adjusting for differences in age, sex, and household composition. However, in actual dollars spent, households in the highest quintile spent the most on health care in 2000.



Notes:Based on full-year households only.
Data from the Territories are not available.
Due to differences in provincial health plans, average household spending may include provincial health care insurance premiums.

Source: Survey of Household Spending, Statistics Canada.

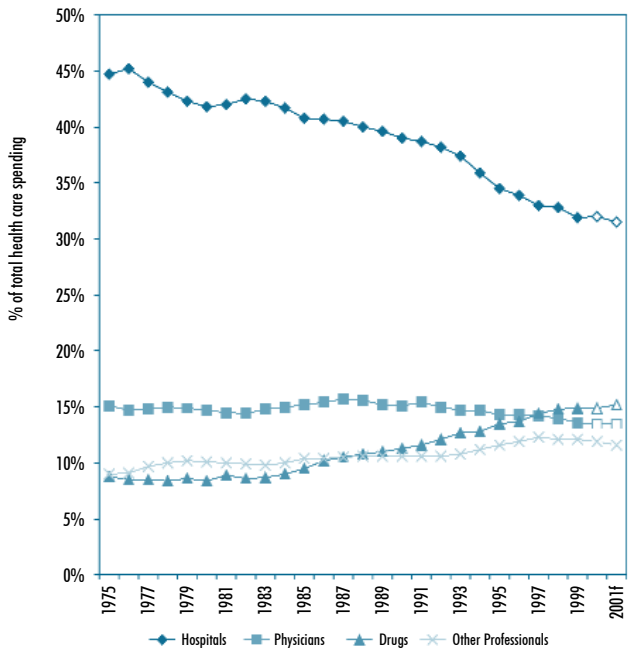
Dividing the Health Care Dollar: Where the Money Goes

The organization and delivery of health care has changed over the last 25 years. So has the way we spend health care dollars. Two decades ago, most surgeries required an overnight stay in hospital. Today, many (such as cataract or hernia surgery and treatment for kidney stones) can often be done safely and less expensively on an outpatient basis. Today's distribution of health care spending reflects these and other changing patterns of care.

In 1975, almost half of all health care spending in Canada (45%) went to hospitals. At more than $32 billion, it was still the largest single category of spending in 2001. That's just over $1,000 per Canadian—up an estimated 4% from 2000. Nevertheless, hospitals' share of total health spending continued to fall. It was 32% in 2001.

Where our Health Dollar Goes 30

The way we spend health care dollars has changed significantly over the last 25 years. Although hospitals still account for the largest single portion of health care spending, their share has dropped over time. In contrast, spending on drugs first exceeded that on physician services in 1997. It has remained higher every year since. The chart below shows the percentage distribution of the top four categories of health care spending from 1975 to 2001. Together, these categories accounted for just under 72% of total public and private health spending in 2001.



Notes: The "other professionals" category includes the services of privately practicing dentists, denturists, chiropractors, massage therapists, orthopedists, osteopaths, physiotherapists, podiatrists, psychologists, private duty nurses, and naturopaths.
Data for 2000 and 2001 are forecast figures.

Source: National Health Expenditure Database, CIHI

Physician services were the second largest portion of the health care spending pie twenty-five years ago, followed by other health institutions, other health professionals' services, and then drugs. Today, retail drug sales have overtaken spending on physician services. They are now the second largest health care expense. For more information, see Chapter 6, *Medicating Illness: Drug Use and Cost in Canada*.

In 2001, physician services were the third largest category of health expenditures. Spending totaled just under $14 billion. That translates to $446 per person, up just over 6% from the year before. As a result, physician services now account for 14% of all health care dollars spent in Canada.

Another area that has seen substantial changes in spending levels in recent years is publicly funded home care. All provincial and territorial governments fund some home care services, but what is covered varies throughout the country. In 1998/1999, Canadian governments spent just under $3 billion on home care, up significantly over the last decade.[34]

Why are home care costs going up? Several factors are likely involved. Possibilities include changing demands for home care services; more reliance on home care as an alternative to acute and long-term care hospitals; changes in informal care availability; greater emphasis on self-managed care; and the changing mix of private and public home care services.[35]

How Doctors Are Paid

Most Canadian doctors are paid on a fee-for-service basis. This means that every time a patient visits a doctor's office, the physician bills the ministry of health for the visit plus any additional services. Some doctors receive all of their professional income on a fee-for-services basis. Others are paid in different ways.

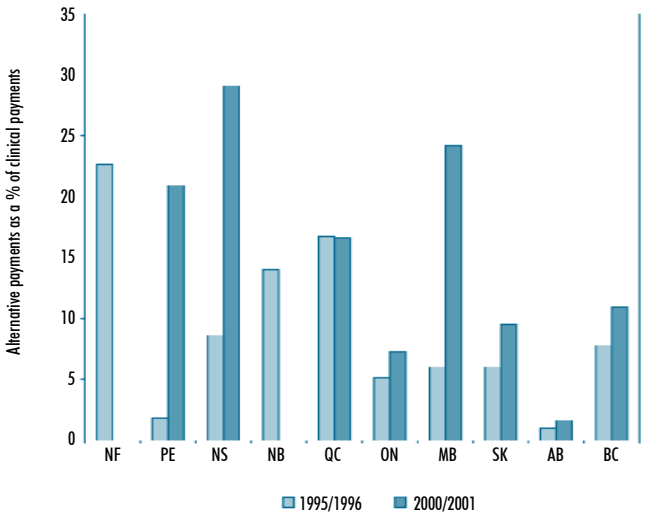
The mix varies across Canada. In Alberta, almost all physicians (estimated at 98% in 1998/1999) are paid only on a fee-for-service basis. That compares to a low of 40% in Manitoba.[27]

In 2000/2001, one in four Canadian physicians received some payments for clinical care through alternative payment plans. Several recent reports have called for expanded use of these types of approaches as part of larger strategies for reforming primary care services.[28,29]

New research is beginning to offer insights into factors that might be considered in designing alternative payment plans.[30,31,32] For example, Manitoba researchers recently studied capitation funding models where a physician receives a set amount per patient cared for. They noted the effect of different patient populations on capitation funding models.[33]

Growing Popularity of Alternative Payment Plans — 31

About $1 billion each year now flows to physicians through "alternative" payment plans (other than fee-for-service reimbursement). That's about 11% of total clinical payments to physicians in the ten provinces in 2000/2001.

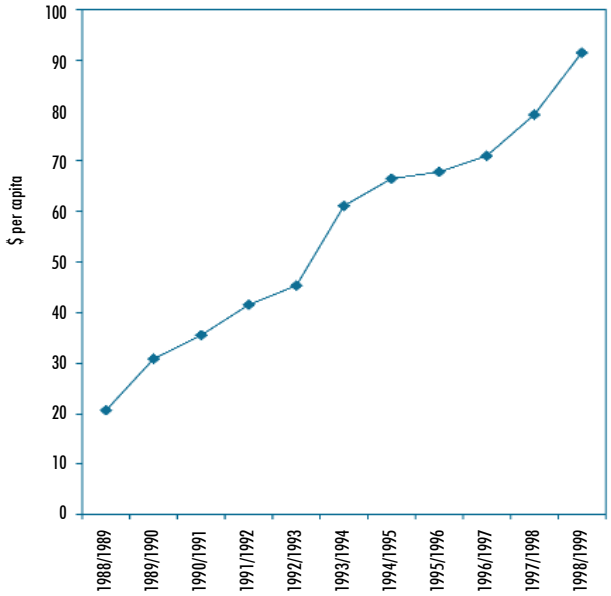


Notes: Data for Newfoundland and New Brunswick from 2000/2001 were not available at the time of publication.
In Alberta, data from 25 Alternative Payment Program projects transferred to Regional Health Authorities (not funded through Alberta's medical services budget) were not available.

Source: Complied by CIHI.

Growth in Home Care Spending 32

Spending on care provided in the home by health care workers or through health programs supported by governments at the provincial or community level is on the rise. Total provincial home care spending increased by over 350% between 1988/1989 and 1998/1999. At the beginning of this period, home care accounted for 1.6% of total provincial health spending. By 1998/1999, it had risen to 4.7% of the total. The graph below shows changes in spending by provincial governments on home care per person over time. Data have not been adjusted for inflation.



Source: Home Care Feasibility Study, National Health Expenditure Database, CIHI.

Who Uses Public Home Care in Manitoba?

Researchers from Manitoba's Centre for Health Policy recently looked at the delivery of home care services in their province.[36] They found that home care programs served just under 3% of the population in 1998/1999. The following groups were most likely to have received public home care services:

- Older Manitobans
- Unmarried residents in all age groups
- Those who later entered a nursing home (93% in 1998/1999 received home care services prior to their admission)
- Residents of poorer urban neighbourhoods who left hospital or had outpatient surgery (compared with residents of middle and upper-income neighbourhoods).

Information: Another Resource for Health

Human and financial resources are key inputs to an effective health care system. But they are not all that is important. This year, we take a special look at information, an increasingly important resource for health and health care.

Our knowledge about health and health care is expanding rapidly. Each year, about 400,000 new references are added to MEDLINE, a database of biomedical journals run by the US National Library of Medicine. In this context, keeping up-to-date with best practices and new technologies in health care is a challenge.

One way of addressing this challenge is to make better use of information and communications technologies. In Canada, as in other parts of the world, individuals and health organizations are increasingly moving in this direction. For example, all provinces and territories are investing in information systems to support health care programs, although the pace of implementation varies across the country.[37]

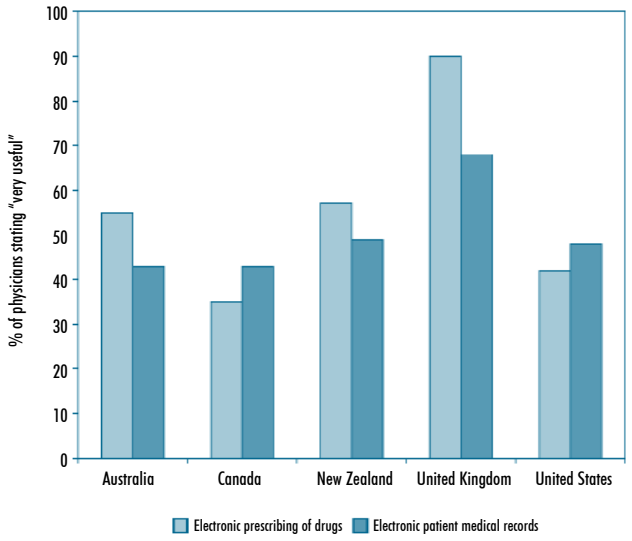
Health organizations and care providers are also developing and using new technologies, such as electronic health records (EHRs). EHRs bring together—under strict privacy and security protocols—information about a patient's various contacts with the health care system. By integrating information about a patient's medical history, hospital stays, laboratory tests, drug prescriptions, and more, EHRs aim to reduce duplication and improve the quality, accessibility, portability, and efficiency of care.[37,38]

Setting up electronic health records is complex. Appropriate privacy safeguards, standards for data exchange, information systems, and other fundamental building blocks are required. A number of groups are working on these issues. For example, many jurisdictions have passed legislation

protecting the privacy of health information. Already, many EHR-related initiatives are moving forward in Canada and elsewhere. For instance, just over 12% of Canada's family doctors reported that they were using EHRs on a 1999 survey by the College of Family Physicians of Canada.[39] More than a quarter believed that they would be using EHRs within the next five years.

What Doctors Think 33

In an international survey of physicians in 2000, about four in 10 Canadian doctors felt that electronic medical records would be "very useful" in improving quality of care. Among the five countries surveyed, physicians in the United Kingdom tended to be most positive about the quality-related benefits of both electronic patient medical records and electronic prescribing of drugs.



Source: 2000 International Health Policy Survey of Physicians, Commonwealth Fund.

Individual Canadians are also increasingly accessing electronic sources of health information, even though the quality of information on the web is variable.[40,41] Statistics Canada's Household Internet Survey[42] has found a steady increase in the use of the Internet for obtaining health information. Between 1998 and 2000, the proportion of Canadians who reported using the web for this purpose more than doubled from 10% to 23%. And more than half (57%) of all households who regularly used the Internet at home reported that they were using it to obtain health information.

In another survey, most Internet users reported going on-line to get information about specific illnesses.[43] Others used it for different reasons. These included diagnosing themselves, confirming or disputing a physician's diagnosis, checking the results of medical studies, identifying clinical trials for breakthrough treatments, finding out more about specific prescription drugs, or chatting with others with similar health conditions.

Even though many Canadians are using the Internet as a health information source, a 2001 survey found that 7 in 10 would still rather talk to their physician about their health. And 43% of those surveyed would consult their pharmacist for information about their medications.[44] Nevertheless, a recent survey of patients at Toronto's University Health Network found that fewer than half (48%) of those who retrieved health information from the Internet presented it to a health care professional. Younger patients and those with higher levels of education were more aware of the Internet. Age and education also had an impact on use of the Internet in general, on obtaining health information, and on the tendency to share the information with care providers.[45]

It's not only patients who are using the Internet to access health information. In 2001, the Canadian Medical Association reported that almost 80% of doctors were using the Internet at their home or office. Over 30% of those surveyed reported referring patients to medical web sites on an occasional basis.[46]

Information Gaps—Some Examples

What We Know

- The number of regulated health care providers and new health graduates in Canada and how this has changed over time.
- How health care spending is changing over time.
- How spending in Canada compares to other countries.
- How much, on average, Canadian households spend on health care each year.
- The proportion of Canadian households using the Internet to access health-related information.

What We Don't Know

- Given demographic, workforce, health, health care and other trends, how does the current combination of health care providers align with the health needs of the current and future Canadian population?
- How might different mixes of public and private funding and service delivery particularly in rapidly expanding areas such as home care and drugs affect costs, access, quality and patient outcomes and satisfaction?
- What impact will changes in regulatory models and professional scopes of practice have on the supply and distribution of health professionals, on our ability to meet future health care needs, on how professionals organize and provide services, and on the quality of care?
- How much is spent each year specifically on health promotion and prevention activities in Canada?
- What are the effects on health and health care of increasing access by individual Canadians and care providers to vast amounts of health information over the Internet?

What's Happening

- A number of studies are underway at national, provincial/territorial, and local levels to better understand health human resources issues.
- In January 2002, the provincial/territorial premiers committed to working with CIHI to institute a pan-Canadian database on human resource needs, training requirements, and scope of practice to assure a sustainable supply of health professionals.
- CIHI is conducting a feasibility study to separate public health (prevention and promotion) programs and administration expenditures.
- Hospitals and community health services organizations will soon be able to better capture dollars spent on information technology thanks to upcoming improvements in the Management Information Systems Guidelines.
- Major projects are underway in most parts of the country to increase the use of information and communications technologies, in an effort to improve health and health care. These initiatives will, no doubt, be shaped by existing and emerging legislation and guidelines on the protection of personal health information.
- The government of Canada has committed $500 million to Canada Health Infoway Inc. (CHII). This funding is targeted to establish and accelerate the development and adoption of modern health information systems and deployment of a pan-Canadian electronic health record. Presently, a national registry of electronic health record initiatives is being developed.[47]

For More Information

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Part B: In-Depth Reports

4. Outcomes Of Care

"First do no harm" is a fundamental principle of medical ethics, carried forward from ancient times. But how do we know what harm or good we do? More than a century has passed since Florence Nightingale first used mortality rates to vividly demonstrate how sanitary reforms dramatically cut deaths in the Crimean War. On this side of the Atlantic, Ernest Codman, a physician, challenged hospitals in 1910 to track patients to determine if their treatments were effective.[1]

Measuring outcomes—and applying the results to continually improve care—is an on-going challenge. This chapter highlights new findings for a number of health conditions—heart attacks, stroke, asthma, transplants, and cancer. Further details and other important health outcome data can be found in the *Health Indicators 2002* insert to this report, as well as on our Web site (www.cihi.ca).

The information presented here is an important start—and a significant advance on the set of comparable outcome data that we had even last year. The measures, such as survival rates following a diagnosis of cancer or how often people need to return to hospital, are useful first steps, but they are still incomplete. For example, they may tell us what happened, but not why it happened. Better and more complete information is essential, not only for a fuller understanding of the quality of care, but also for finding solutions to problems. In different parts of the country and nationally, a number of focused initiatives are underway or planned to address this challenge. We look forward to continuing to work with partners across the country to advance these efforts.

Surviving A Heart Attack Or Stroke

Heart disease and stroke are major causes of illness, disability, and death in Canada. Together, they accounted for 20.4% of male and 11.4% of female hospitalizations in 1999/2000, according to CIHI data.

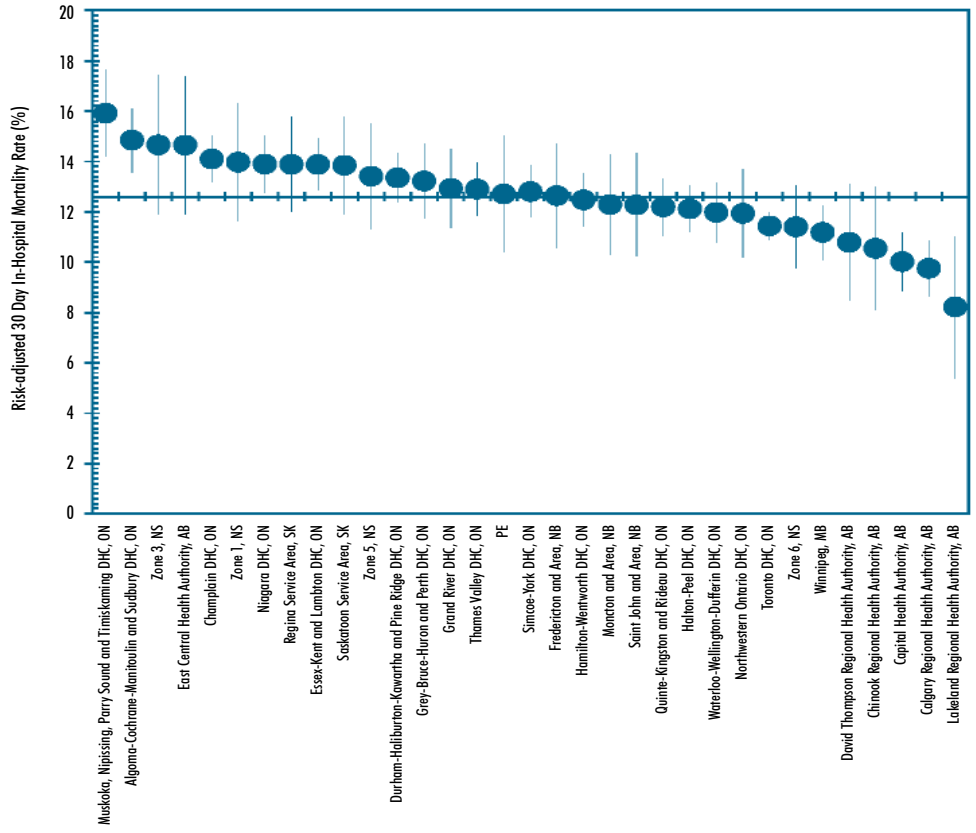
The care that these patients receive in hospital may affect their chances of survival and their quality of life after they are discharged.[2] So may many other factors, not all of which are well understood. For example, research in Ontario found that, after taking into account differences in age, sex, and the availability of health services, people living in poorer neighbourhoods were less likely to get some specialized treatments for AMI than those living in wealthier neighbourhoods. They were also more likely to have died.[3]

Last year, CIHI found that 12.65% of patients died in a hospital within 30 days of an initial heart attack (or acute myocardial infarction-AMI) hospitalization in 1998/1999.[4] We also calculated rates for many of Canada's largest health regions. Our research showed that in-hospital death rates varied from region to region, although few regions' rates were statistically significantly different from the overall average. To make rates as comparable as possible, we adjusted for regional differences in age, sex, and comorbid conditions (illnesses present at the same time as the heart attack). The methods that we used have been well-tested in Ontario and elsewhere.[5]

Research from Statistics Canada also shows regional differences for one-year mortality rates among heart attack patients hospitalized in 1995/1996 for four provinces (British Columbia, Alberta, Saskatchewan, and Nova Scotia). Differences were apparent even after adjusting for age, comorbidity, and revascularization procedure (i.e. angioplasty and/or bypass graft). However, there were fewer regional differences for females than for males.[6]

Regional Variations in Mortality Following a Heart Attack 34

Across the country, 12.6% of patients died in hospital within 30 days of an initial hospitalization for a heart attack between 1997/1998 and 1999/2000. Most regions had rates similar to this overall average but some were statistically significantly higher or lower from the overall average, even after adjusting for age, sex, and other co-existing illness. Available data covering this three-year period for regions with a population of 100,000 or more are shown below. The rates (shown by circles) are estimated to be accurate to within the range indicated by the vertical bars 19 times out of 20 (95% confidence interval). The solid line represents the overall average of 12.6%.



Note: Data from British Columbia, Newfoundland, and Quebec are not available due to differences in how hospital data are collected. For some hospitals in Newfoundland, 1998/1999 data reported in last year's report have been found to be not comparable and therefore should be disregarded.

Source: Hospital Morbidity Database, CIHI

New for 2002

This year, we have moved forward in two ways: computing AMI mortality rates over a three-year period (not just a single year) and, for the first time, calculating estimates of 30-day in-hospital mortality following a stroke for regions across the country.

Overall, 12.6% of patients died in a hospital within 30 days of initially being hospitalized for an AMI between 1997/1998 and 1999/2000.* Most regions had mortality rates that were about the same as this average, but some had higher or lower rates. Similar to last year, several regions in Alberta had lower risk-adjusted mortality rates. Capital Health Authority (Edmonton), Calgary, and Lakeland all had rates of 10% or under. Five regions in Ontario had rates above the overall average.

About Our Results

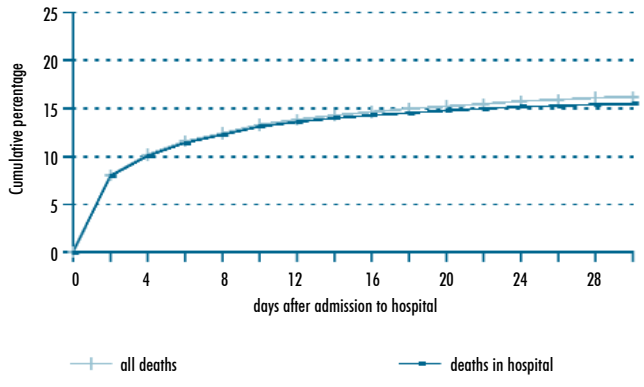
This study uses data from CIHI's Hospital Morbidity Database. To make mortality rates as comparable as possible, we used these data to develop risk-adjusted regional mortality rates over a three-year period. Rates and confidence intervals for regions with a population of 100,000 or more are included in *Health Indicators 2002*, an insert to this report. Detailed descriptions of our methods and technical notes are available on the CIHI web site (www.cihi.ca).

Understanding the results:

- Our analysis is based on where patients live, not where they are treated. As a result, the rates reflect mortality for AMI or stroke patients resident in a region (who may also receive care elsewhere), rather than the outcomes of care for hospitals in the region (who may also treat patients from other areas).
- We included only patients who had a new AMI or stroke, leaving out anyone who had already been hospitalized with the condition in the past year. We included both ischemic (interruption of blood flow to the brain) and hemorrhagic (the rupture of blood vessels in the brain) stroke, in the analysis, as well as those reported as "ill-defined". This decision, along with other aspects of the stroke indicator, was reviewed with experts from the Canadian Stroke Network.
- We counted deaths within 30 days in any hospital, not just those in the first hospital where a patient was treated. We could not include patients who died before reaching a hospital.
- We used well-tested methods to adjust for differences in age, sex, and co-morbidity across regions. Nevertheless, we could only use data available to us. Consequently, differences across regions may reflect variations in risk factors, in care before admission and after discharge, or in hospital documentation practices that we were not able to take account of, not just the quality of care patients received in hospital.
- This study compares 30-day in-hospital mortality rates, a commonly used outcome measure in research studies on both AMI and stroke. For these patients, there is a strong, but not perfect, relationship between deaths in hospital and out of hospital over this period. For example, Statistics Canada found that about 95% of all deaths within 30 days of initial hospitalization for AMI in 1995/1996 in three provinces occurred in a hospital. The majority of deaths within one year after an AMI occur within the first 30 days.
- We report 95% confidence intervals for all mortality rates. These intervals tend to be larger (i.e. the rate estimate is less precise) for regions that treat fewer patients. For example, Toronto's AMI rate is estimated to be accurate to within ± 0.52 percentage points 19 times out of 20. In contrast, Lakeland, Alberta's (with only a fraction of Toronto's cases) is within ± 2.83 percentage points. As a result, we based the rates that we report here on data pooled over a three-year period (1997/1998 to 1999/2000).

Deaths In and Out of Hospital for AMI **35**

Cumulative rate of death up to 30 days after initial hospitalization with AMI, three provinces, 1995/96.



Source: Person-Oriented Information Project, Statistics Canada

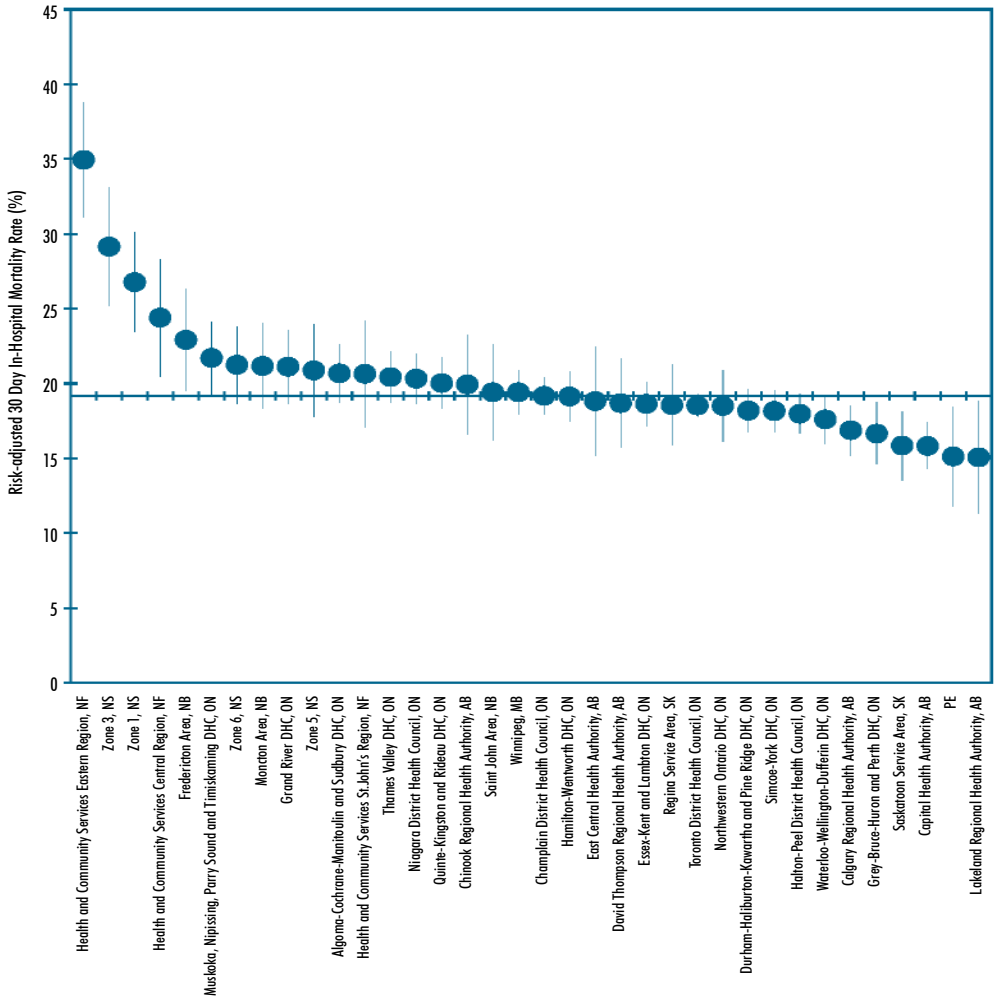
* Rates for British Columbia, Quebec, and Newfoundland are not available due to differences in how hospital data are collected.

The stroke findings are similar to those for AMI. Overall, 19.2% of stroke patients died in a hospital within 30 days of initial hospitalization between 1997/1998 and 1999/2000.‡ In most cases, rates for large health regions (with a population of 100,000 or more) were similar to this overall average. But, 12 of 36 regions had rates that were statistically significantly different from it: six were higher and six were lower. Across all regions included, mortality rates ranged from 15% to 35%.

Why do mortality rates for some regions differ from the overall average? Some of the variation may be due to risk factors or conditions that we were not able to adjust for. For example, specialized care

Regional Variations in Mortality Following a Stroke 36

Across the country, 19.2% of patients died in hospital within 30 days of initial hospitalization for a stroke between 1997/1998 and1999/2000. As for heart attacks, many regions had rates that were about the same as this overall rate. But others have higher or lower rates even after adjusting for age, sex, and other co-existing illness. Available data over this three-year period for regions with a population of 100,000 or more are shown below. The rates (shown by circles) are estimated to be accurate to within the range indicated by the vertical bars 19 times out of 20 (95% confidence interval). The solid line represents the overall average of 19.2%.



Note: Data from British Columbia and Quebec are excluded due to differences in how hospital data are collected.

Source: Hospital Morbidity Database, CIHI

‡ Data for Quebec and British Columbia were not available due to differences in how hospital data are collected.

following stroke has been related to survival.[7,8,9] However, Ontario researchers note that people living in poorer neighbourhoods have less access to some of these services and are more likely to die following a stroke than those living in wealthier neighbourhoods.[7] Other factors may also play a role, including disease severity, lifestyle choices, and medication compliance.[8,9] Not all of these factors are well documented in patient records. And, still others may exist that are not well understood today. As a result, these data are an important step, but just a first step, in an on-going process to better understand outcomes of care and the factors that contribute to them.

Returning to Hospital

Most patients recover at home or in other types of facilities once discharged from the hospital. However, some must return to hospital within a short period because they experience further health problems or need additional care.[10]

The quality of care a patient receives while hospitalized can influence readmission rates. So too, can a variety of other factors, such as how sick they are, their ability or willingness to undertake post-hospital treatment, the level of follow-up care available in their community, and much more. Not all readmissions are avoidable or preventable, but high rates can trigger further exploration and analysis.[11]

What is a readmission and how are readmission rates calculated?

This study uses data from CIHI's Hospital Morbidity and Discharge Abstract Databases. It builds on methods originally developed by researchers at the University of Toronto to calculate quality-related readmission rates in Ontario for selected inpatient procedures including AMI and asthma.[17] We adapted these methods, designed to calculate rates at a hospital level, to produce readmission rates for large regions across Canada.

Understanding the results:

- As far as possible, we only counted unplanned readmissions due to a related health problem within 28 days after the first or index admission. A return to hospital for planned surgery (e.g. revascularization or pacemaker procedures following an AMI admission) would not be counted. Similarly, when a patient was readmitted for a condition clearly not attributable to the initial diagnosis, we did not count it as a readmission. Patients admitted with conditions of cancer or HIV were also excluded. So were patients who signed themselves out of hospital or died during their initial hospital stay. These decisions were based on the advice of clinical panels.
- Our analysis is based on where patients live, not where they are treated. As a result, rates reflect readmissions for patients resident in a region (who may also receive care elsewhere), rather than the outcomes of care for hospitals in the region (who may also treat patients from other areas).
- To avoid multiple counting, patients transferred from one acute care hospital to another within 12 hours of discharge from the first hospital, were generally considered to have had a single admission (i.e. a transfer, not a readmission). If more than one true readmission occurred within the 28-day period, we included only the earliest one in the analysis.
- We used well-tested methods to adjust for differences in age, sex, and co-morbidity across regions. Nevertheless, we could only use data available to us. Consequently, differences across regions may reflect variations in risk factors, in care before admission and after discharge, or in hospital documentation practices that we were not able to take account of, not just the quality of care patients received in hospital.
- Ninety-five percent confidence intervals were calculated for all readmission rates. The confidence limits tend to be larger (i.e. the rate estimate is less precise) for regions with fewer patients in a given year. For example, Toronto's readmission rate for AMI is estimated to be accurate to within ± 0.53 percentage points 19 times out of 20. In contrast, the rate for AMI readmission in East Central Health Authority in Alberta (with only a fraction of Toronto's cases) is within $\pm$ 2.57 percentage points. As a result, we based the rates that we report here on data pooled over a three-year period (1997/1998 to 1999/2000).

Rates and confidence intervals for regions with a population of 100,000 or more are included in *Health Indicators 2002*, an insert to this report. Detailed descriptions of our methods and technical notes are available on the CIHI web site (www.cihi.ca).

Readmissions for AMI and Asthma

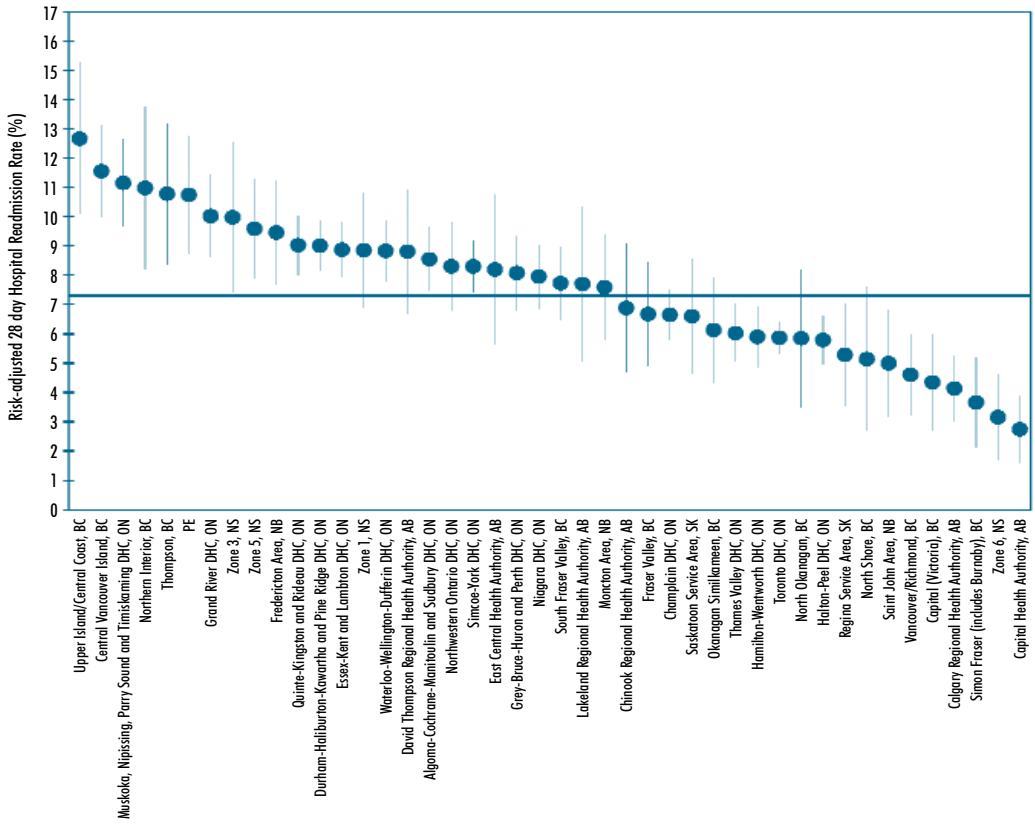
In Canada and elsewhere, many researchers have studied hospital readmission rates.[10,11,12,13,14,15,16] This year, for the first time, we report on hospital readmission rates for AMI, asthma, hysterectomy, and prostatectomy at the regional level across much of the country.[§]

Across all regions (large and small), 7.3% of AMI patients had an unplanned return to hospital within 28 days due to a related health problem. For asthma, the rate was 6.4%. Many regions were similar to the overall rates, but some were significantly different, even after adjusting for differences in risk factors. For example, seven health regions had readmit rates for AMI of under 5%, and seven regions had rates that were more than twice as high.

Readmission rates for asthma also showed some regional variations. Ten regions—five in British Columbia, two in Alberta, and one each in Saskatchewan,

Regional Variations in Heart Attack Readmissions 37

The chances of a patient being readmitted to hospital within 28 days of initial hospitalization for heart attack (adjusted for age, sex, and other co-existing illness) varied from region to region between 1997/1998 and 1999/2000. Available data for over this three year period for regions with a population of 100,000 or more are shown below. The rates (shown by circles) are estimated to be accurate to within the range shown by the bars 19 times out of 20 (95% confidence interval). The solid line represents the overall average of 7.3%. Regions where data were unavailable or where a valid risk-adjusted rate could not be estimated with the existing data have been omitted.



Note: Data from Manitoba, Newfoundland, and Quebec are excluded due to differences in how hospital data are collected.

Source: Discharge Abstract Database, CIHI

[§] Results for Newfoundland (AMI only), Manitoba, and Quebec were not available due to differences in how hospital data are collected.

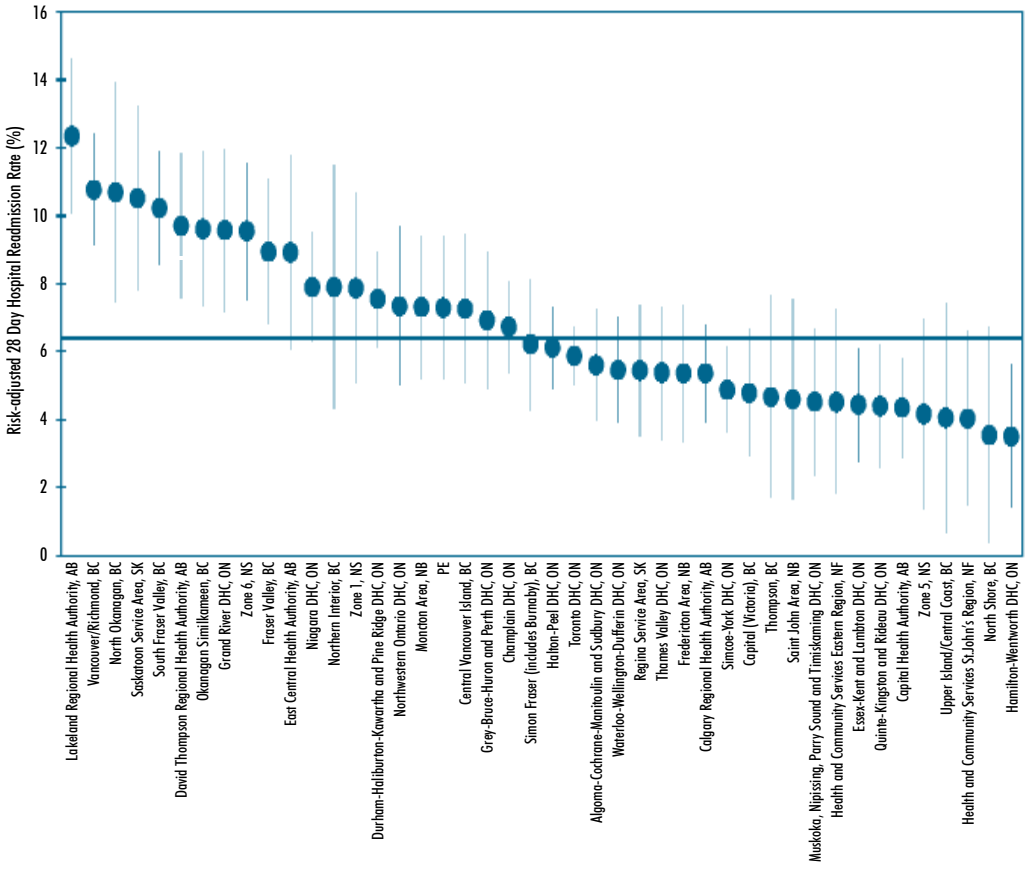
Ontario, and Nova Scotia—had rates that were substantially higher than the overall average. Five regions—four in Ontario and one in Alberta—had rates that were substantially lower than the overall average.

Why do readmission rates vary from region to region? Rates can be affected by a number of factors. Some are related to care during the initial hospital stay, but many are not. For example, the chances of readmission after hospitalization for an AMI may be affected by patient characteristics, the availability of appropriate diagnostic and other technology during the initial hospital stay, follow-up care after discharge, and many other factors.

As for the 30-day in-hospital mortality indicators, many of these additional factors are not well documented in patient records nation-wide. Likewise, additional reasons for variations may also exist, even if they are not well understood today. Once again, in understanding how hospital care affects short- and long-term health outcomes, these measures should be considered in the context of other information, such as patient characteristics, patient care, and health services in and out of hospital.

Regional Variations in Asthma Readmissions 38

The chances of a patient being readmitted to hospital within 28 days of initial hospitalization for asthma (adjusted for age, sex, and other co-existing illness) varied from region to region between 1997/1998 and 1999/2000. Available data over this three-year period for regions with a population of 100,000 or more are shown below. The rates (shown by circles) are estimated to be accurate to within the range shown by the bars 19 times out of 20 (95% confidence interval). The solid line represents the overall average of 6.4%. Regions where data were unavailable or where a valid risk-adjusted rate could not be estimated with the existing data have been omitted.



Note: Data from Manitoba and Quebec are excluded due to differences in how hospital data are collected.

Source: Discharge Abstract Database, CIHI

Survival After A Cancer Diagnosis

Cancer is the leading cause of premature death in Canada. It is responsible for about one-third of all potential years of life lost.[18] The National Cancer Institute of Canada estimates that there were 134,000 new cancer cases and 65,300 deaths attributable to cancer in 2001.

How does a cancer patient's risk of dying compare to that of the general population? To find out, Statistics Canada calculated five-year "relative" survival rates for patients diagnosed with primary breast, colorectal, lung, or prostate cancers in 1992.

What is a Relative Survival Rate?

Relative survival rates for cancer measure how much more likely it is that someone diagnosed with cancer will die within a specified time period compared to a similar person in the general population. For example, consider two hypothetical groups of ten people. The first is newly diagnosed with some type of cancer. The second with similar age, sex, and province of residence characteristics is chosen at random from the general population. Five years later, five of the first group and seven of the second are still alive. The ratio of the survival in the first group to that of the second group is the relative survival. In this example, those diagnosed with this cancer were 71% (5/7) as likely to survive five years as were those from the general population.

Diagnosed with Cancer

☹ ☹ ☹ ☹ ☹ ☺ ☺ ☺ ☺ ☺

survival = 50%

General Population

☹ ☹ ☹ ☺ ☺ ☺ ☺ ☺ ☺ ☺

survival = 70%

Relative Survival = 50%/70% = 71%

☺ = survived at least 5 years

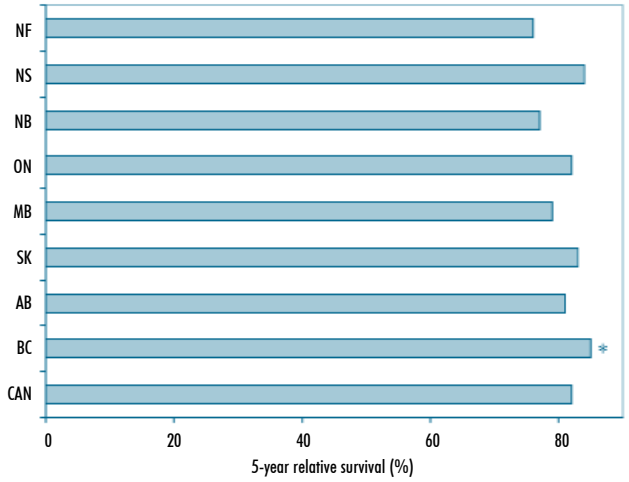
☹ = deceased within 5 years

Note: Numbers are for illustrative purposes only. They do not represent actual survival rates.

They found that relative survival rates sometimes depend on where you live. For example, five-year relative survival for people diagnosed with prostate (91%) or breast cancer (85%) was highest in British Columbia. This compares to national rates of 87% and 82% respectively. For colorectal cancer patients, relative survival was lowest for men in New Brunswick (47%), compared to 56% for all men, nationally. In general, lung cancer patients continue to have the worst survival prospects. National five-year relative survival rates were 14% for men and 17% for women.

Surviving Breast Cancer 39

A woman between the ages of 15 and 99 diagnosed with breast cancer in 1992 had a five-year **relative** survival rate of over 80%, but inter-provincial variations exist. British Columbia had the highest five-year relative survival rate at 85%.



Note: Rates are age-standardized to the 1992 Canadian case distribution of the cancer site under study. Results for Prince Edward Island, the Yukon, and the Northwest Territories are not shown because of an insufficient number of cases. The national rate excludes Quebec due to its difference in cancer reporting methodology but does include Prince Edward Island, the Yukon, and the Northwest Territories.

* significantly different ($p < .05$) from the national breast cancer relative survival rate of 82%.

Source: Canadian Cancer Registry, Statistics Canada

In general, longer survival times could mean one of two things. It could be that cancer is being diagnosed at an earlier stage (possibly because of effective screening programs). Or, it could mean that patients with cancer are living longer, perhaps due to better treatment. With improved tracking of tumor stage in the future, it should be possible to disentangle these and other effects.

Childhood Cancer

For Canada's children, a diagnosis of cancer isn't the death sentence it once was.[18] Over the last 30 years, survival chances have improved substantially. Five-year survival rates are now about 75%.[19] That's good news for the 1,266 children each year who were diagnosed with cancer, on average, between 1992 and 1996, according to the National Cancer Institute of Canada. The bad news is that an average of 249 children still died of cancer each year. The most common childhood cancer is leukemia. It accounts for 26% of new cases and 32% of deaths. Other common types include brain and spinal cord cancer (17% of new cases) and lymphoma (16% of new cases).[18]

When One Organ Fails…

It's almost 70 years since the first human-to-human kidney transplant operation was performed in 1933. Unfortunately, the kidney never functioned. It took another 20 years before Boston surgeons performed the first successful kidney transplant operation.[20] Today, kidney transplants, as well as the transplantation of other organs, are increasingly common.

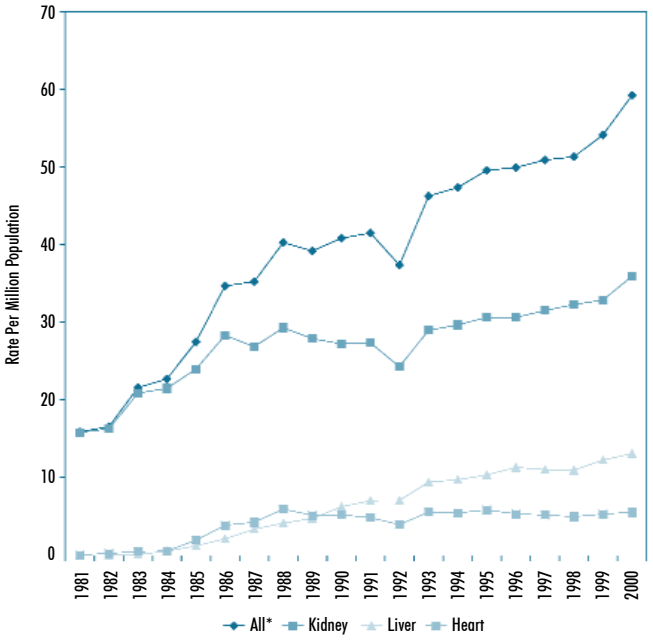
Islet Cell Transplantation

In people with Type I diabetes, islet cells are destroyed by the body's immune system. These cells produce insulin, which helps the body use glucose for energy. Pancreatic islet cell transplantation has been considered as a possible long-term treatment option. In pancreatic islet transplantation, cells are taken from the donor pancreas and transplanted into the recipient. The hope is that the transplanted cells start producing insulin for the new host. In 1989, researchers at the University of Alberta performed the first Canadian islet cell transplant. The operation wasn't successful in the long-term. In 1999, the same researchers developed a new transplantation procedure with these cells. The procedure became known as the "Edmonton Protocol". So far results seem promising. But further research is required to establish long-term outcomes. [21,22]

Across Canada, 27 hospitals performed a total of 1,820 single organ transplants in 2000. Most (61%) were for kidneys, followed by livers (22%), hearts (9%), and lungs (almost 7%).

Increasing Transplant Activity 40

The graph below illustrates the number of transplants per million population by organ type. Kidney transplants are by far the most common type of solid organ transplants. Rates of kidney and other transplants have generally increased over time, as the graph below shows.



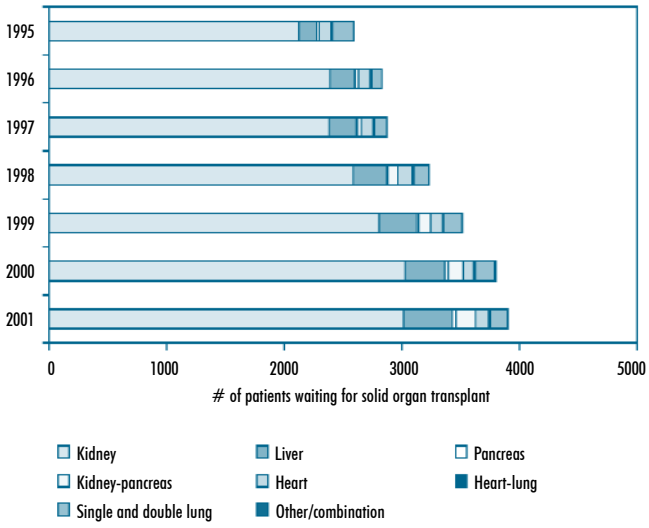
Note: "All" also includes pancreas, heart-lung, single lung, double lung, and bowel transplants.

Source: Canadian Organ Replacement Register, CIHI

Nevertheless, the number of patients waiting for organ transplants is climbing. As of September 30, 2001, 3,901 patients were waiting for a solid organ transplant in Canada. That's up 51% from 1995. About three-quarters (77%) of those on the 2001 waiting list needed a kidney transplant. Another 11% were waiting for a liver. Heart, single and double lung, and kidney/pancreas patients accounted for less than 5% each.

The Waiting Game 41

As of September 30, 2001, there were 3,901 patients waiting for a solid organ transplant in Canada, up 51% from 1995. In 2001, almost 77% of patients on the waiting list were waiting for kidneys, followed by patients waiting for livers (11%), and hearts (3%).



Notes: As of 1997, waiting lists include patients who are "on hold" (patients who cannot receive a transplant for a medical or other reason for a short period of time) as well as active patients who can receive a transplant any time.

The kidney waiting list for British Columbia has been frozen for everyone except priorities (i.e. pediatrics, multi-organ transplants, and medical priorities) since October 2000. As a result, there has been a decrease in the reported number of patients waiting for kidney transplants between 2000 and 2001 in that province.

Source: Canadian Organ Replacement Register, CIHI

Living vs. Deceased Donors—Is there a Difference?

An organ transplant can either come from a cadaveric donor or a living donor. What's the difference? A cadaveric organ donor is a donor who is declared brain dead and has consented to the donation of an organ(s). A living organ donor, on the other hand, is alive. They usually have a biological (related) and/or emotional relationship (unrelated) to the transplant recipient. Living donors most commonly donate one of their kidneys. However, a living donor may also donate a lung or part of a liver, lung, or pancreas.

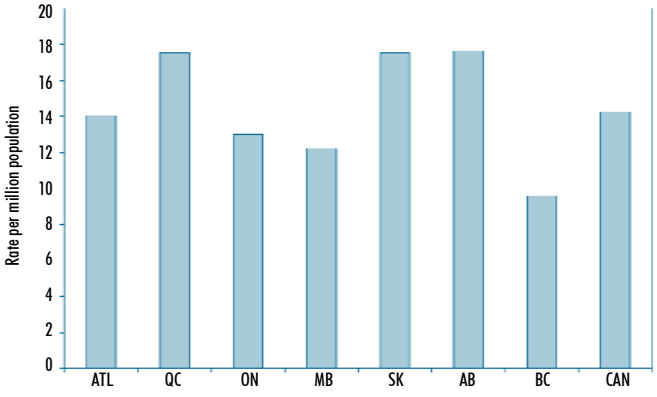
Patients who receive organs from living donors tend to have better survival outcomes than those who receive cadaveric organs.[23,24] Possible explanations include better tissue matching between the living donor and recipient, improvements in the use of immunosuppressive drug therapy, shorter waiting times for patients, improved white blood cell antigen matching, and greater oxygen content in the living donor organ tissue.[24,25]

Organ supply is not keeping pace with this rising demand. Cadaveric donor rates have been relatively stable over the past five years. The current rate is approximately 14 per million population. In contrast, living donor rates have more than doubled since 1992. In 2000, Canada's live donor rate was 13.3 per million population.

Both cadaveric and living donor rates vary across the country. Between 1998 and 2000, Alberta, Saskatchewan, and Quebec had the highest cadaveric donor rates. Why do provincial donor rates vary? It's possible that population characteristics, hospital resources, cultural differences, and other factors (some of which may not yet have been identified) play a role.[23]

Leaving a Legacy 42

Between 1998 and 2000, the average cadaveric organ donor rate in Canada was 14.3 per million population. Alberta (17.6), Saskatchewan (17.5), and Quebec (17.5) had donor rates above the national average. British Columbia had the lowest rate, at 9.6 donors per million population.



Note: The three-year average for the regions above are not adjusted for factors which may affect organ donor rates, such as population characteristics, hospital resources, or cultural differences.

Source: Canadian Organ Replacement Register, CIHI

Another way to measure cadaveric donation rates is to calculate the proportion of potential donors who actually donate organs for transplant. This measure is more complicated because it requires an estimate of the number of "potential" donors. CIHI recently released a discussion paper which explored administrative methods to measure potential donors. Depending on the method used, between 1992 and 1998, approximately four to fifteen out of every 100 potential cadaveric organ donors ended up being organ donors. These methods take into account potential differences among the provinces in age, sex, mortality, and other factors.[26]

Xenotransplantation—Should Canada Proceed?

Growing waiting lists for transplants have meant that scientists are searching for alternatives. Xenotransplantation—transplanting animal cells, tissues, or organs into humans—is one controversial possibility.

Governments recently asked the Canadian Public Health Association to convene an advisory group to develop recommendations on animal-to-human transplants. As part of this process, they consulted with the general public in two ways: a telephone survey and a two-day citizen forum. The feedback that they received differed. For example, 65% of respondents to the telephone survey said that Canada should go ahead with xenotransplantation. In contrast, only 46% of those attending the citizen forum, which included receiving extensive background information on the topic, agreed.

Issues raised during the consultation process included:

- Concerns about health risks and the number of unsuccessful attempts to date;
- A desire to find a means of addressing the current organ shortage in Canada; and
- The need for strict and clear legislation and regulation of research practices with clinical trials before xenotransplantation is undertaken.

At the end of the day, the Advisory Group concluded that Canada should not proceed with xenotransplantation until these issues could be resolved.

After a Transplant…Survival

In Canada, the chances of surviving one, three, or five years following an organ transplant have been increasing. People receiving kidney or heart transplants between 1995 and 2000 had better survival chances than those who received transplants between 1989 and 1994.

For kidney transplants, survival chances were about the same in all regions of the country where data were available between 1995 and 2000. That's true at the one-, three-, and five-year marks.

Survival Five Years Later 43

Five-year survival estimates for Canadians receiving a kidney or heart transplant between 1995 and 2000 were higher than for patients transplanted between 1989 and 1994. The table below shows the survival estimates and their 95% confidence intervals.

Time of Transplant	Cadaveric Kidney	Liver	Heart
1989-1994	83.9% (83.0-85.0)	71.3% (68.3-74.4)	69.1% (66.3-71.9)
1995-2000	87.3% (85.7-88.9)	76.2% (72.6-79.7)	77.4% (74.8-79.9)

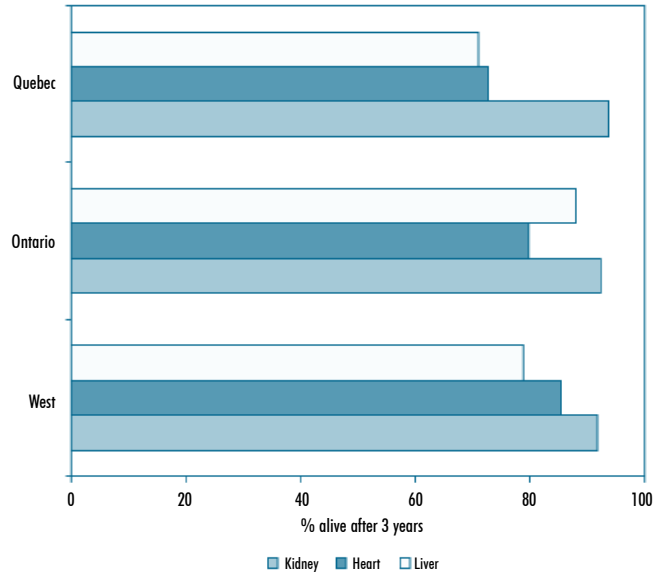
Source: Canadian Organ Replacement Register, CIHI

There were, however, pockets of differences for those having heart and liver transplants. For example, three-year survival for heart transplant patients was higher in the West (85.4%) than in Quebec (72.7%).[†] For liver transplants, the probability of surviving three years was higher in Ontario (88.0%) than in Quebec (71.0%) and the Western provinces (78.9%). A number of possible explanations for these differences exist, including unidentified variations in risk factors, such as patient comorbidity (e.g. other co-existing illnesses, such as diabetes or hypertension).

[†] Statistically significantly different (p=0.05).

Regional Survival Differences 44

Patients who received cadaveric kidney transplants in Quebec, Ontario, and the western provinces between 1995 and 2000 had relatively similar outcomes. In contrast, some regional variations in unadjusted survival rates were noted for heart and liver transplants. This may be due to differences in actual survival chances, in comorbid conditions, in the extent and accuracy of reporting between regions, or in other factors.



Note: Data from the Atlantic provinces are suppressed.

Source: Canadian Organ Replacement Register, CIHI

On the International Front

Comparisons within Canada are often hard. Comparing transplant survival between countries is even more difficult. How countries count and distribute their resources often varies and can affect research results. So can differences in patient characteristics and other factors. Bearing this in mind, cautious comparisons are possible. According to recent data (January 1990 to December 1998), Canadians have better chances of surviving a kidney transplant than do Americans.

International Comparisons in Survival Rates 45

Survival rates five years after a kidney transplant were higher for Canadian patients in each of the age groups shown below than for their American counterparts. In contrast, Canadians aged 35 to 49 had worse outcomes for liver transplantation. Data are for patients who received transplants between January 1990 and December 1998. Ninety-five percent confidence intervals are shown in brackets below the survival estimates.

5 year survival				
Age Group	Cadaveric Kidney Transplant		Liver Transplant	
	Canada	US	Canada	US
18-34	94.4% (93.1-95.5)	90.9% (90.3-91.5)	77.7% (71.9-83.3)	78.0% (76.0-80.0)
35-49	89.0% (87.6-90.3)	85.5% (84.9-86.1)	72.4% (68.7-75.9)	77.6% (76.6-78.6)
50-64	79.9% (77.9-81.8)	74.9% (74.1-75.7)	67.0% (63.6-70.4)	69.5% (68.3-70.7)

Source: Canadian Organ Replacement Register, CIHI; 2000 Annual Report, UNOS Scientific Registry Data (US).

Volume and Surgical Outcomes—Another Look

All surgery carries risks. The goal is to minimize risks, with a view to bettering long-term health, well being, and life expectancy. This is the balancing act that thousands of Canadians who have surgery each year face.

When you need surgery, many factors can affect where you get the operation. If you need emergency surgery, there may be little choice. But when a procedure is planned in advance, recommendations from physicians, family, or friends may affect where you seek care. Location, availability, and convenience might also be decisive. And many other factors may enter into the decision.

In last year's report, we noted that the number of both rare and common surgical procedures currently performed by individual hospitals in Canada varies, often significantly. At the same time, for many types of care and for many different surgeries, research shows that patients treated in hospitals with higher numbers of cases are often less likely to have complications or to die after surgery.[28]

Many of the studies are from other countries, but Canadian researchers have studied some types of care in detail.[29,30]

Volume-outcome relationships are also clearly an area of current Canadian clinical and policy interest. Indeed, the recent Sinclair inquest found that "the limited number of cases [of pediatric cardiac surgery] that can be undertaken in a province like Manitoba with a population of just over one million increases the risk of morbidity and mortality."[31] And Canada's first ministers recently committed to sharing human resources and equipment in order to develop sites of excellence that will specialize in low-volume procedures such as pediatric cardiac surgery and gamma knife neurosurgery.[32]

The Situation in Canada: New for This Year

This year, we expanded our analysis of surgical volumes to a broader range of procedures. Some, such as hysterectomy (removal of the womb) and cholecystectomy (removal of the gall bladder), are already common. Others are less frequent but rates are increasing (e.g. hip and knee replacements). We also included one example of a rare operation: the Whipple procedure (surgery for pancreatic cancer).

In 2000, Dudley and colleagues[28] summarized the findings of a large number of research studies on volume-outcome relationships. Their systematic review of the literature included the five procedures mentioned above. They found two studies for hysterectomy, four for cholecystectomy, nine for hip replacement, three for knee replacement, and eight for pancreatic cancer surgery. All studies showed better outcomes with higher volumes. In most, but not all, cases results were statistically significant.

Since then, several new studies have appeared. For example, the April 11, 2002 issue of the New England Journal of Medicine[33] carried an article on the relationship between hospital volume and mortality in the United States. Journal editors said that it might be the largest such study conducted to date.[34] In future systematic reviews, its findings can be integrated with those of previous studies.

Researchers examined the outcomes of Medicare patients (aged 65 to 99) who received one of 14 types of cardiovascular and cancer procedures. The study included 2.5 million surgeries performed between 1994 and 1999. For all types of procedures studied, researchers found that higher volume hospitals tended to have lower risk-adjusted mortality rates. But the strength of this relationship varied from procedure to procedure. The absolute difference in risk-adjusted mortality rates between the lowest and highest volume hospitals ranged from 0.2% to over 12%.

While it seems clear for at least some procedures that volume-outcome relationships exist, what isn't entirely clear is why. Some have suggested that, simply put, practice makes perfect. That is, hospitals that have higher volumes develop better skills.[35,36]

Surgery in Canada: Who Does What and How Many 46

Every year, surgeons perform hundreds of thousands of procedures in hospitals across the country. Some are common. Others are rare. To illustrate the range, the table below summarizes how selected procedures are delivered, how many procedures were performed in 1999/2000, and how these numbers have changed over time.

Procedure	Type of operating setting*	Usually performed by	# performed in Canada in 1999/2000	Change from 1997/1998 to 1999/2000
Hysterectomy	Non-spec.	Gynecologists	55,404	3.5%
Cholecystectomy** (gall bladder removal)	Spec. for laparoscopic non-spec. for open	General surgeons	More than 50,000	2.7%
Knee replacement	Spec.	Orthopedic surgeons	21,649	13.2%
Hip replacement	Spec.	Orthopedic surgeons	19,853	10.6%
Pancreatic cancer surgery (Whipple procedure)	Spec.	General surgeons	458	16.5%

Notes:
* Spec=specialized setting, non-spec=non-specialized setting
**Excludes Quebec, Manitoba, and Alberta due to differences in how hospial data are reported.

Source: Hospital Morbidity Database and Discharge Abstract Database, CIHI

Another possible explanation is that more people go to hospitals that have better outcomes. That is, superior performance attracts more patients over time. This is known as the "selective referral" theory.[35,37]

Another outstanding question is the exact nature of the relationship between volumes and outcomes. For example, is there a "threshold" number of cases—a specific volume for a particular procedure—associated with better outcomes? Or do outcomes get steadily better with higher case volumes? For the most part we don't know.

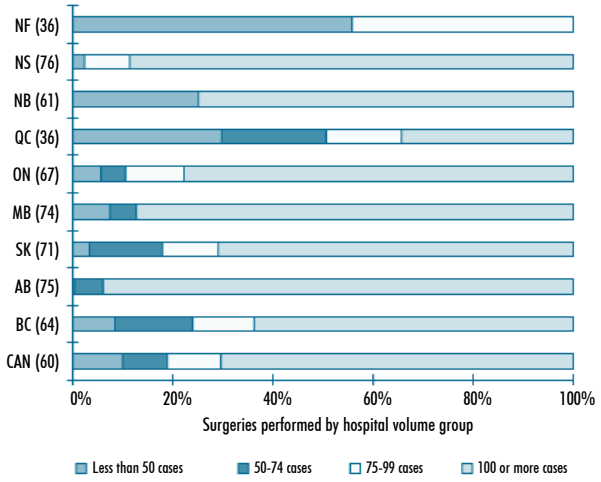
What the Data Show

Most Canadians receive surgery in high volume hospitals, but many hospitals perform a very small number of procedures. For example, while over seven in 10 of the knee replacements done in 1999/2000 were performed in hospitals doing over 100 cases are year, almost seven percent (or 1,474) were done in hospitals doing less than 50 cases a year.

In addition, the degree to which care is concentrated in a few high-volume centres isn't necessarily related to the total number of procedures performed. For example, in Quebec, almost 30% of the 2,700 knee replacements and 2,900 hip replacements in 1999 took place in hospitals that did fewer than 50 procedures per year. Whereas in Manitoba and Nova Scotia—two provinces with less than half the volume of cases as in Quebec—under 8% in 1999/2000 were performed in hospitals with fewer than 50 cases.

Volumes of Hip Replacements Across Canada 47

The degree of centralization of hip replacement surgery varies across the country. The graph below shows the percent of surgeries performed in hospitals caring for fewer than 50, 50-74, 75-99, or 100 or more cases in 1999/2000. The number in parentheses is the age-standardized rate of hip replacements per 100,000 residents in 1999/2000. For example, residents of Nova Scotia, Manitoba, and Alberta were the most likely to have hip replacement surgery.

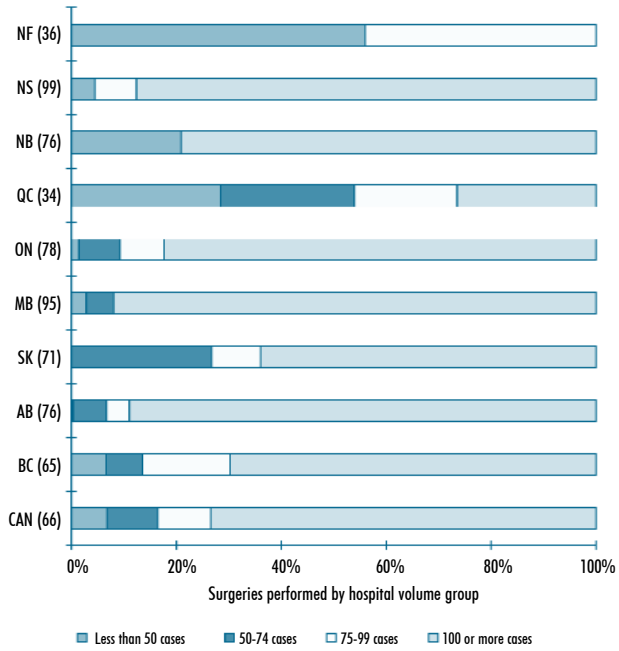


Note: Data for PEI were suppressed due to confidentiality considerations.

Source: Hospital Morbidity Database, CIHI

Volumes of Knee Replacements Across Canada 48

The degree of centralization of knee replacement surgery varies across the country. The graph below shows the percent of surgeries performed in hospitals caring for fewer than 50, 50-74, 75-99 or 100 or more cases in 1999/2000. The number in parentheses is the age-standardized rate of knee replacements per 100,000 residents in 1999/2000. For example, residents of Nova Scotia and Manitoba were the most likely to have knee replacement surgery.

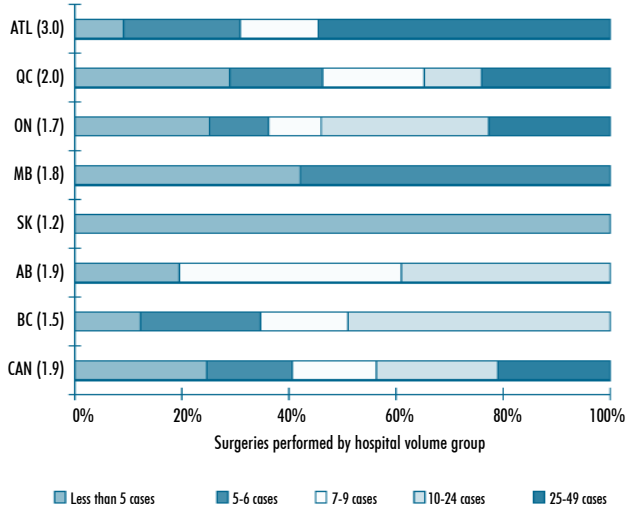


Note: Data for PEI were suppressed due to confidentiality considerations.

Source: Hospital Morbidity Database, CIHI

Volumes of Pancreatic Cancer Surgery Across Canada 49

The degree of centralization of pancreatic cancer surgery, also known as Whipple procedure, varies across the country. The graph below shows the percent of Whipple procedures performed in hospitals caring for fewer than 5, 5-6, 7-9, 10-25, or 25-49 cases in 1999/2000. The number in parentheses is the age-standardized rate of Whipple surgeries per 100,000 residents in 1999/2000. This type of surgery is very rare.



Note: Data for the Atlantic provinces were grouped due to confidentiality considerations.

Source: Hospital Morbidity Database, CIHI

Trade-Offs to be Made?

Concentrating surgical procedures in centres that perform a large number of cases—sometimes referred to as regionalization or centralization—may lead to significant benefits. These include developing specialized expertise in health care teams, optimal use of costly equipment, and achieving better outcomes for patients.

On the other hand, many argue that centralizing care could have adverse effects, especially in rural areas. For example, it might create travel burdens, interfere with continuity of care, and ultimately decrease access to necessary care for patients living far from referral centres.

As we said last year, deciding how much to centralize care requires us to strike a balance across these issues. This balance is likely to vary from procedure to procedure and place to place.

To support the discussion, we have again included rates of several types of surgery and patient inflow/outflow indicators in *Health Indicators 2002*. The latter show variations in the extent to which patients travel from region to region to seek care. A high score on this measure suggests a larger degree of centralization with many patients coming in from outside the region for care. Specialized procedures, such as coronary artery bypass surgery, tend to be more centralized than more common types of operations, such as gall bladder removal or hysterectomies.

In this context, systematic reviews of the research literature, an understanding of current Canadian volume patterns, and better information about patient outcomes at individual hospitals could all provide evidence to support decisions about how best to organize health services and distribute health care resources.

Information Gaps—Some Examples

What We Know

- How death rates (adjusted for age, sex, and comorbidities) in the first 30 days after initial hospitalization with an AMI or stroke compare across the country.
- How readmission rates (adjusted for age, sex, and comorbidities) in the first 28 days after initial hospitalization for AMI, asthma, hysterectomy, and prostatectomy compare across the country.
- How five-year age-standardized relative survival rates for breast, prostate, colorectal, and lung cancer compare provincially.
- Transplant and organ donor statistics, as well as long-term survival for kidney, liver, and heart transplant patients.
- For different types of surgery, how many surgical cases take place in high- and low-volume settings.

What We Don't Know

- What explains regional differences in mortality, readmissions, and survival?
- For which, if any, surgeries do hospitals performing low numbers of operations place patients at higher risk of complications and death? For these procedures, what is the optimal or minimum number of cases a hospital should perform to provide safe and effective care? How many deaths could potentially be prevented by ensuring that surgery is provided at high-volume centres? What would be the other trade-offs if surgical procedures were centralized?
- What is the relationship between how much we spend on particular interventions and the benefits they provide?
- How healthy are patients three, six, and 12 months after most types of surgery?

What's Happening

- Health Canada and the Canadian Standards Association are working together on the development and publication of national standards to improve organ and tissue donation practices in Canada. The standards are expected to be completed in 2003.
- Canada's premiers and the prime minister agreed to track and report on longer-term survival following AMI and stroke, where possible, by September 2002.
- Researchers at the University of Alberta are continuing to investigate the long-term outcomes of islet cell transplants in people who have Type I diabetes. As of October 2001, 12 of 15 transplant patients participating remain insulin free. Vancouver Hospital has also embarked on a research study to examine the potential benefits of islet cell transplantation for Type I diabetes.
- Following the first ministers' January 2002 meeting in Vancouver, health ministers were directed to develop an action plan to implement sites of excellence for low-volume procedures, such as pediatric cardiac surgery and gamma knife neurosurgery. The action plan is set to be tabled at the first ministers' meeting in August, 2002.
- CIHI and the Canadian Institutes for Health Research are co-sponsoring research to estimate the extent of adverse events in Canadian hospitals and the availability of data that could be used to support continuous monitoring and reduce these events.

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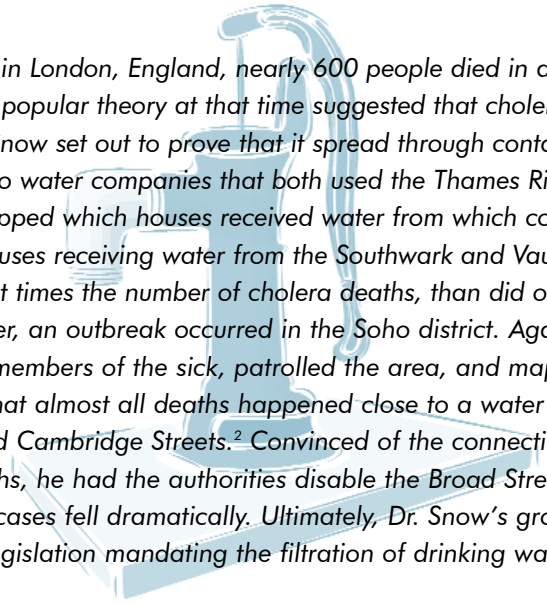
5. Public Health: On Guard Year After Year



In the mid-1800s in London, England, nearly 600 people died in a cholera epidemic. Although popular theory at that time suggested that cholera was airborne, Dr. John Snow set out to prove that it spread through contaminated water.

He focused on two water companies that both used the Thames River as their source. He then mapped which houses received water from which company. Dr. Snow found that houses receiving water from the Southwark and Vauxhall Company had more than eight times the number of cholera deaths, than did others.[1]

A few months later, an outbreak occurred in the Soho district. Again, Dr. Snow interviewed family members of the sick, patrolled the area, and mapped out deaths. He found that almost all deaths happened close to a water pump on the corner of Broad and Cambridge Streets.[2] *Convinced of the connection between the pump and the deaths, he had the authorities disable the Broad Street pump. The number of cholera cases fell dramatically. Ultimately, Dr. Snow's groundbreaking discoveries led to legislation mandating the filtration of drinking water.*

Recent outbreaks in Walkerton, North Battleford, and elsewhere remind us that safe water is as essential for health today as in the 1800s. Public health has had impressive victories since that time. They have significantly improved health and reduced the burden of disease in Canada and around the world. But experience has shown that constant vigilance and on-going action are required to capitalize on and maintain these gains. And challenges, such as HIV, continue to emerge.

Traditionally, public health focused on controlling infectious diseases through vaccination, food and water safety, and other activities. Many programs also evolved to detect diseases early using routine screening tests and to educate Canadians about personal behaviours that affect health. The "new public health" goes even further. It is concerned with a broad range of health determinants, including early childhood development; social policies and practices; and interactions among biological, social, cultural, and environmental factors.[3] This approach often involves a combination of interventions at different levels with a variety of partners.

This chapter describes a sample of the wide variety of public health initiatives underway across the country.

An International Vision for Health Promotion

In 1986, experts from around the world endorsed the *Ottawa Charter for Health Promotion*.[4] Its broad vision of the determinants of health and need for inter-sectoral action for health continues to inform today's health policy debates.

The Charter argues that the fundamental conditions and resources for health are peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity. It calls for coordinated action to build healthy public policy, create supportive environments, strengthen community action for health, develop personal health skills, and reorient health services.

Containing Disease

Major killers from the past—such as smallpox, polio, cholera, measles, and the plague—are gone or very rare in Canada today, but many challenges remain. For example, communicable diseases continue to affect thousands of Canadians each year. These diseases are transmitted directly or indirectly from one person to another.

Health protection and disease prevention programs are designed to anticipate, avoid, and address these and other immediate and imminent threats to health. In this section, we focus on four examples—monitoring the safety of water supplies, routine vaccinations, syphilis control, and cancer screening programs.

Drinking Water Safety

Human life depends on water, but contaminated water can kill. About a billion people living in developing countries are at risk because they are without clean drinking water, according to United Nations estimates.[5] Most Canadians are more fortunate. We generally do have access to safe drinking water. But, as recent events have reminded us, maintaining these systems requires sustained effort and commitment.

Parasites, bacteria, viruses, and both natural and "man-made" chemicals can all contaminate drinking water. Unsafe food and water can make us sick, often with stomach or intestinal illness. Each year, Health Canada receives reports about the number of Canadians who become sick with food and/or water-borne illnesses. Campylobacteriosis, salmonellosis, and giardiasis ("beaver fever") were the most common conditions reported on average from 1994 to 1998.[6] Many more cases go unreported, partly because people with milder symptoms may not seek professional care for their illnesses. In fact, Health Canada estimates that as few as 10% of all cases may actually be reported.[7] Likewise, Ontario researchers estimate that only one out of every four to eight cases of illnesses related to *E. coli* are ever reported.[8]

Not all gastrointestinal illness is caused by water-borne pathogens, but public health professionals have made the link in a number of cases. For example, a recent *Vancouver Water Study* found that water-borne pathogens were present in the water supply and had contributed to gastrointestinal illness in Vancouver.[9] Since 1985, there have been 18 outbreaks of water-borne illness in British Columbia alone.[10] Similarly, a source well contaminated with *E. coli* led to 1,346 reported cases of gastroenteritis and seven deaths in Walkerton, Ontario in May 2000.[11] About a year later, there was an outbreak of cryptosporidiosis in North Battleford, Saskatchewan.[12] In this case, an equipment breakdown at a water treatment plant allowed a parasite into the water supply. Between 5,800 and 7,100 people—almost half the city's population—became ill.

Lessons from Walkerton

Walkerton's experience offers hard-won lessons to all parts of the country. Justice O'Connor led an Inquiry to determine what happened. His recent report included a wide range of recommendations to ensure the safety of future water supplies, such as:

- All vacant Medical Officer of Health (MOH) positions in the province should be filled. Local MOH roles should be clarified and strengthened.
- The Ministry's Public Health Branch should continue to track trends in non-compliance by Public Health Boards on a yearly basis to assess whether program and service guidelines or resources need to be changed to ensure full compliance.
- The government should ensure adequate resources so that inspections are thorough and effective.
- The Public Health Branch should provide written guidance to MOHs, including the steps to be taken once inspection reports and water sample test results are received.
- Regular meetings should be scheduled to discuss public health issues.
- A Boil Water Protocol should be developed, outlining circumstances under which to issue boil-water advisories.
- The Ministry of the Environment (MOE) should develop criteria for identifying "groundwater under the direct influence of surface water" and maintain information on quality of source water.
- Continuous chlorine and turbidity monitoring should be implemented.
- All certificates of approval should be limited to five years and subject to renewal with required conditions added.
- Both announced and unannounced inspections should be conducted, with unannounced inspections at least once every three years. Municipal water systems and systems with significant deficiencies should be inspected at least annually. The MOE should establish and enforce time lines for preparation and delivery of inspection reports.
- There should be standard certification for all water system operators.
- The government should clearly define and implement training and the MOE should devote sufficient resources to technical training.

Ensuring Safe Drinking Water

By the time that water trickles out of a tap, it has often had a long journey through a complex water supply system. Whether the source is an underground spring or surface water, water can become contaminated anywhere along the way from the source to the tap.

Water Quality on First Nations Reserves

For most Canadians, safe drinking water is as close as the kitchen tap, but that's not true for everyone. In 1978, almost half (about 47%) of homes on Canada's reserves did not have access to water delivery systems.[13] By 1994/1995, almost all (94%) of these homes had water supplies that met minimum standards according to Indian and Northern Affairs Canada.

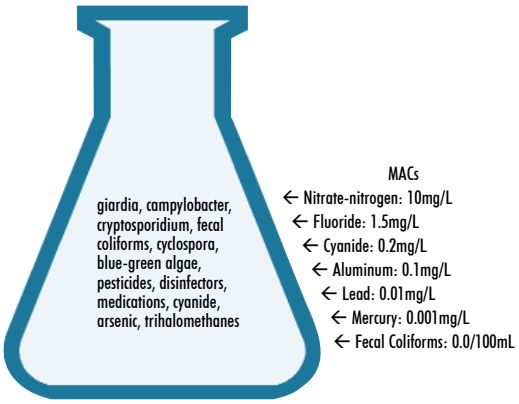
Nevertheless, a 1995 study of 863 on-reserve water systems found a number of problems.[14] One in five systems (20%) had problems that could potentially affect health, and one in 20 (5%) were in need of serious repairs or improvements. In addition, more than a quarter (26%) had non-health-related problems, such as system capacity or water smell or taste.

The federal government reports that steps have been taken to address many of these issues.[13] And more than three-quarters of First Nations and Inuit people surveyed (78%) said that there was some or good progress in water and sewage facilities on reserves between about mid-1995 and mid-1997.[15] Nevertheless, the Assembly of First Nations reports some drinking water systems on reserves still have problems.[16]

The Federal-Provincial-Territorial Subcommittee on Drinking Water sets the *Guidelines for Canadian Drinking Water Quality*.[17] These basic parameters are relevant for all water systems: public, semi-public, and private. The Guidelines include the maximum acceptable concentration of many microbiological, chemical, physical, and radiological agents in safe drinking water.

What Is, and What Can Be, Found in Our Drinking Water? 50

The *Guidelines for Canadian Drinking Water Quality* lay out maximum acceptable concentrations (MACs) for chemicals and microbiological organisms in our water. Under these guidelines, no coliforms, such as *E. coli*, should be detected in our water supply. Varying amounts of chemicals are allowed, depending on their expected affect on our health. Some substances, such as calcium, are seen to have no health risk and are not included in the *Guidelines*. Other agents not covered in the guidelines, both natural and "man-made", may also be found in the water. In some situations, some of these—like giardia, campylobacter, and cryptosporidium—may affect our health.



Source: Adapted from *Guidelines for Canadian Drinking Water Quality*, March 2001.

Each jurisdiction regulates and monitors its supplies of drinking water, but processes differ across the country. In most cases, direct monitoring of water quality is a local, municipal responsibility (water treatment facilities are often owned and operated by individual municipalities). The regulatory framework within which this occurs varies from place to place. For example, only three provinces directly apply the *Guidelines* as their standard; three require operator training or certification; five use certified or accredited testing labs; six use provincial or agency testing labs; and eight provinces/territories have mandated disinfection.[18]

Some Canadians also choose to drink bottled water. In a 1999 poll, about 40% of Canadians reported drinking bottled water in their homes.[19] We drank an average of over 23 litres per person in 1998, up from 18 litres in 1995.[20] In comparison, we consumed more than four times as much in soft drinks, alcohol (based on population age fifteen and over), and coffee.

The federal *Food and Drugs Act* regulates bottled water and prepackaged ice. In 2000, the Canadian Food Inspection Agency reviewed practices at 125 bottled-water manufacturers.[21] Most met the assessment standards, but about 11% needed follow-up action to ensure that appropriate controls were in place.[21] In a related study of bottled water sold in retail outlets, all 148 samples tested were satisfactory.

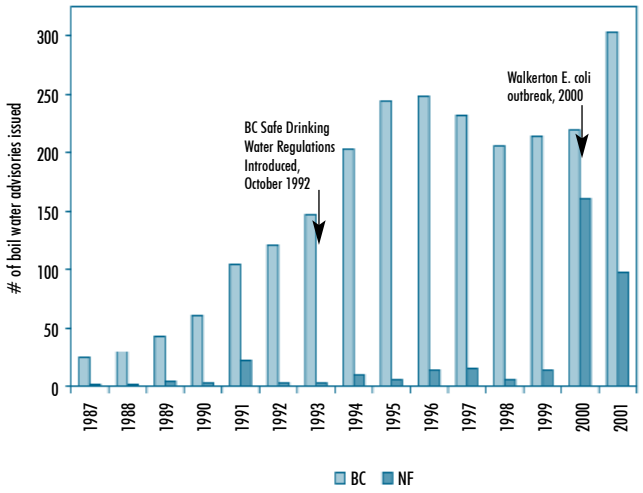
Boil-Water Advisories—An Immediate but Temporary Solution?

What happens when water is contaminated? If the problem is bacteria, boiling the water can be a solution. Accordingly, regional and local health units or authorities often issue boil-water advisories when they learn of water problems. These public health announcements are often broadcast through local and/or national radio, local television, printed pamphlets, and other means.

In the case of disease outbreaks, authorities usually keep the advisory in place until rates of illness in the community return to pre-outbreak levels. For example, the Bruce-Grey-Owen Sound Health Unit's boil-water advisory related to problems with Walkerton's water remained in effect for 199 days. The resulting heightened awareness of water-borne illness may also have had spin-off effects elsewhere in the country. For example, British Columbia and Newfoundland have tracked the number of boil-water advisories over many years. After the Walkerton outbreak, the number of advisories issued rose sharply in both provinces.

Boiling Our Water 51

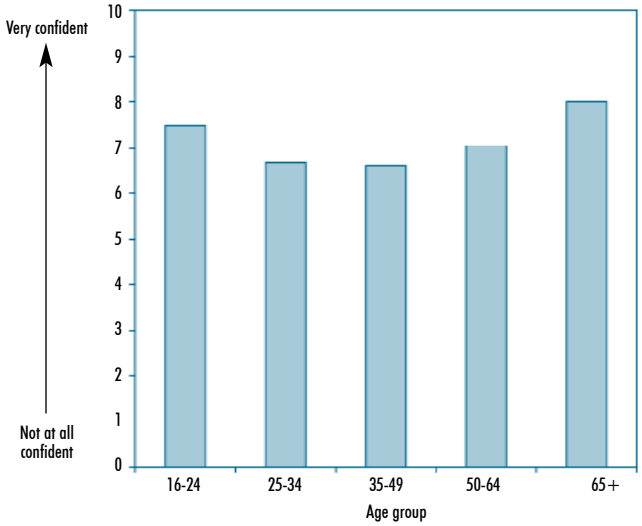
When high levels of some contaminants are found in drinking water, public health officials may issue boil water advisories. The number of advisories issued in a given period depends on many factors such as increased testing, more contamination of the water, or authorities adopting a more cautious approach to reduce risk. The graph below shows the number of advisories issued on the east and west coasts of the country (Newfoundland and British Columbia) between 1987 and 2001, as well as two major events related to drinking water quality that occurred in this period.



Sources: *Drinking Water Quality in British Columbia: The Public Health Perspective. A Report on the Health of British Colombians.* (2001). Ministry of Health Planning, Office of the Provincial Health Officer; Boil Water Advisories for Community Water Supplies in Newfoundland and Labrador, Departments of Environment and of Government Services and Lands, 1987-2001.

Trusting the Water 52

A 2001 national survey found that younger and older Canadians express more confidence in drinking water than those in the middle age groups. This difference in confidence may reflect personal experience with the water supply, general attitudes toward the public health system, or many other factors. The graph below shows average confidence levels on a scale of one to 10 by age group.



Source: Drinking Water Survey, Erin Research Inc. September, 2001.

What Canadians Think

Most of us believe that the water in our homes is safe to drink, according to an Internet-based survey of about 800 Canadians in September 2001.[22] On average, respondents gave their water a score of 6.9 on a ten-point scale, where one was not at all confident and 10 was very confident. People who said that they used wells or municipal water supplies had significantly more confidence in the safety of the water (7.7 and 7.3 out of 10, respectively) than those who said that they drank bottled water (5.6 out of 10).

In another 2001 poll, 68% of respondents reported that they were confident in the quality of their drinking water.[23] Men were more likely than women to be extremely confident in the quality of their drinking water (37% versus 29%). In addition, people living in Alberta and Quebec were more confident in the quality of tapwater than those living in other provinces. Ontarians were less confident than those living in the rest of the country.

A Shot in the Arm for Public Health

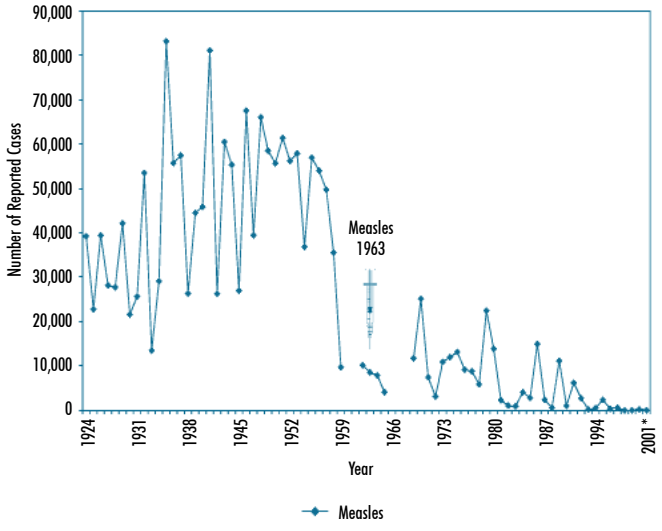
Only clean water has had more impact on public health than vaccinations, according to the World Health Organization (WHO).[24] The world's first vaccine was born in 1798 when Edward Jenner showed that an injection of cowpox—a not so deadly virus—protected against smallpox.

Smallpox is thought to have originated in India or Egypt over 3,000 years ago. For centuries, epidemics swept across the world. They left many people dead, disabled, or disfigured. For example, in a survey conducted in Vietnam in 1898, 95% of adolescent children in were pockmarked, and 90% of all blindness was attributed to smallpox.[25]

WHO launched a campaign to eradicate smallpox in 1956. A quarter century later, they declared victory. Significant progress has also been made on other diseases, such as polio and measles. Nevertheless, ongoing surveillance of communicable disease is critical. Only through constant vigilance can outbreaks be caught early and contained.

Beating Childhood Diseases **53**

We can go back as far as 1924 to compare the number of reported cases each year for selected diseases. These numbers fluctuate, as this graph for measles cases in Canada shows. Look at what has happened since the vaccine was introduced in 1963.



Note: 2000 and 2001 data are preliminary estimates. Where lines are broken, no data are available.

Source: Division of Disease Surveillance, Centre for Infectious Disease Prevention and Control, Health Canada.

Protecting Canadian Children

Canadian children are routinely vaccinated against nine diseases: polio, pertussis (whooping cough), tetanus, diphtheria, *Haemophilus influenzae* type b (Hib), measles, mumps, rubella, and hepatitis B.

Each province and territory has developed a routine schedule for childhood vaccinations. These schedules are substantially similar, but some differences do exist.[26] For example, vaccinations for diphtheria, pertussis, polio, and Hib are usually given at two, four, six, and 18 months. A two-dose measles-mumps-rubella (MMR) vaccine is given around one year and again around 18 months. However, in Nova Scotia, Ontario, Manitoba, and Alberta an MMR is given at 12 months and between the ages of four and six. There are also other differences. For instance, the hepatitis B vaccine is sometimes given in infancy and sometimes in early adolescence.

The vaccination schedules continue to evolve over time, partly because new vaccines are introduced. For example, the varicella vaccine against chickenpox was licensed in Canada in 1998. It produces immunity in between 70% and 90% of those vaccinated, with relatively low risk of side effects.[27]

Chickenpox mostly affects children. In most cases, they recover quickly, but the disease can be serious, even fatal, particularly for adults. Potential complications include bacterial infections of the skin and soft tissue, pneumonia, and encephalitis.[28] Vaccination campaigns hope to reduce the frequency of these serious complications, as well as health care costs and indirect costs (e.g. lost wages for parents who stay home to care for sick children).

Some provinces have implemented routine childhood varicella vaccination. For example, Prince Edward Island and the Northwest Territories currently administer a routine varicella vaccine to children at age 12 months.[26] And Nunavut has plans to implement a program in the summer of 2002. Alberta has also phased in the vaccine as part of its routine immunization schedule. In April 2001, grade five students, health care workers, families of immunocompromised individuals, and postpartum women who were found during prenatal visits to be susceptible, became eligible to receive the vaccine.

Three months later, one-year-olds born in the year 2000 were added to the list. And beginning April 2002, children in Alberta could receive the varicella vaccine with their preschool booster if they were at least four years of age.

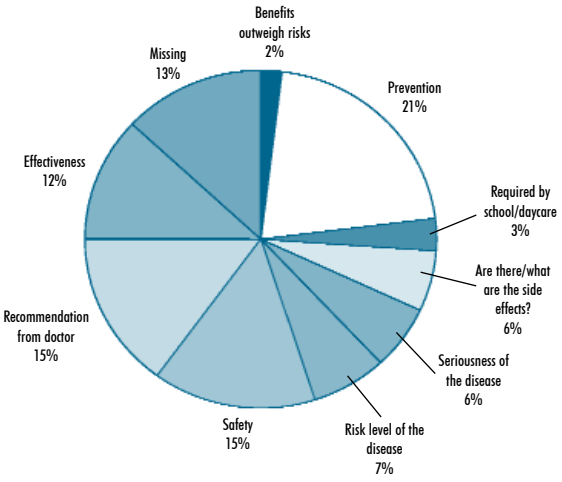
Listening to Canadian Parents

In a survey conducted in 2001, almost all Canadian parents (about 90%) said they believed it was important to vaccinate children.[29] Over 90% also felt that:

- childhood vaccines take pressure off the health care system
- all children should be given all of the standard vaccines
- they would pay out-of-pocket for vaccines for their children
- the government should fund all vaccines

Most Important Factors in Deciding to Vaccinate Children 54

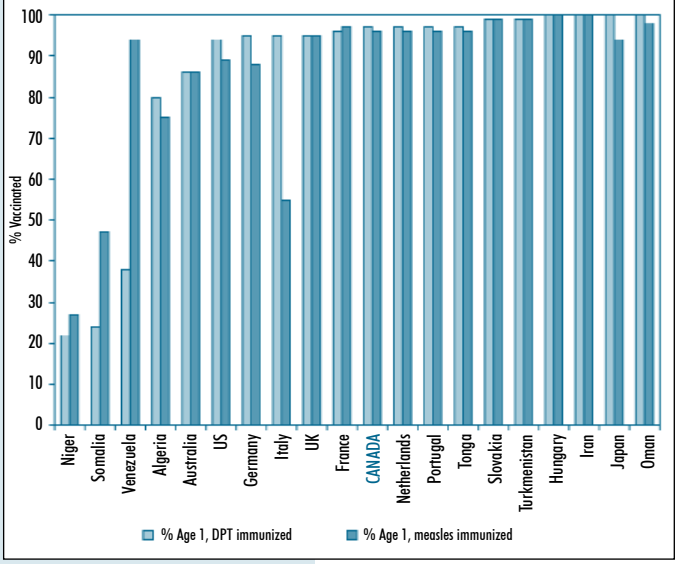
A recent telephone survey questioned parents about their attitudes towards immunization. Most thought that vaccinating their children was very important. They said that several factors played a role in their decisions about whether or not to have their children vaccinated. Disease prevention, doctor's recommendations, and vaccine safety were most often mentioned as considerations.



Source: Canadian Immunization Survey, in Coalition for the Canadian Public Health Association in consultation with Coalition for the Canadian Immunization Awareness Program and the Canadian Coalition for Influenza Immunization. (2001). *The Value of Immunization in the Future of Canada's Health System*. Submission to the Commission on the Future of Health Care in Canada.

Childhood Immunization by Age One 55

As a signatory to the *Declaration of the 1990 World Summit for Children*, Canada has established goals for immunization coverage. Canada has achieved, for the most part, its target vaccination rates of 95-97% by age one for diphtheria-pertussis-tetanus (DPT) and for measles. Some countries report achieving even higher rates of childhood vaccination for these diseases. Others, including several G7 countries, have lower rates as the chart below shows.



Source: *The State of the World's Children*, 2000. UNICEF

Flu Shots for Adults

Influenza, commonly called 'the flu', typically comes on fast and brings headache, fever, chills, cough, muscle aches, and tiredness. Healthy people usually recover from the flu in a few days. However, for some people, complications from the flu can be much more serious and even life threatening.

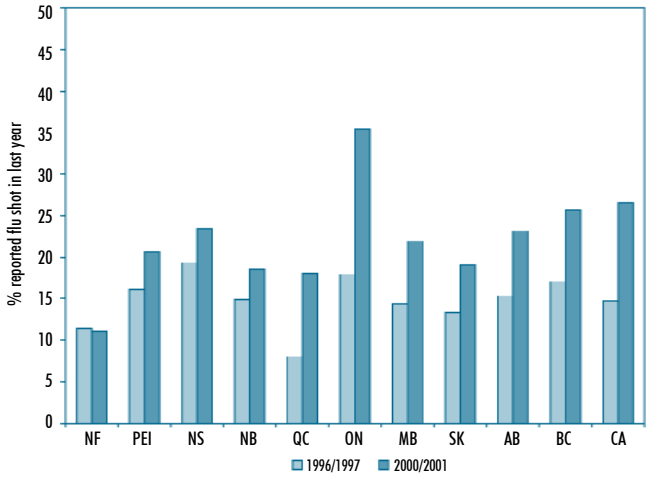
Getting a flu shot each year can not only protect you from getting the flu, it can also minimize the symptoms if you do get it. Vaccination also helps stop the flu's spread from person to person. Because the virus changes from year to year, people must get vaccinated each year to retain the protective effect.

In 2000/2001, Statistics Canada asked Canadians if they had had a flu shot in the last year. About two in three seniors (65%) said they had, compared to 51% in 1996/1997. Flu shot rates for seniors ranged from a low of 45% in Newfoundland to a high of 71% in Nova Scotia.

Vaccination rates are rising. Overall in 2000/2001, 27% of Canadians aged 12 and older reported having a flu shot in the last year, up from just under 15% in 1996/1997. The overall rise in vaccination rates may be partly explained by broad public awareness campaigns and increasing public coverage of the costs of the shots. Almost all provinces and territories fund flu shots for people in specific high-risk groups or for those in regular contact with high-risk groups. Some go further. For instance, Ontario has offered to pay for flu shots for all residents since 2000.

Who's Getting Their Flu Shots? 56

According to the Canadian Community Health Survey (2000/2001), more Canadians are getting their flu shots compared to five years ago. The overall Canadian average went from just under 15% of teens and adults in 1996/1997 to over 27% in 2000/2001.



Sources: National Population Health Survey (1996/1997); Canadian Community Health Survey (2000/2001), Statistics Canada.

Whose Flu Shots are Funded 57

As of March 2000, most provinces/territories had some publicly funded flu vaccination program for high-risk groups, as the chart below shows. Several provinces had planned to expand their programs to cover a broader range of groups at this point. In some cases, such as Ontario, programs recently expanded to cover all residents.

Risk Group	NF	NS	NB	PEI	QC	ON	MB	SK	AB	BC	YT	NT	NU
65	●	●	❍	X	●	●	●	●	●	●	●	●	● *
Resident of LTC facility	●	●	●	X	●	●	●	●	●	●	●	●	●
Chronic cardiac and/or pulmonary disorders	●	●	●	X	●	●	●	●	●	●	●	●	●
Chronic conditions such as diabetes, cancer, renal disease, anemia, hemoglobinopathy, immunodeficiency	●	●	●	X	●	●	●	●	●	●	●	●	●
Age 6m to 18yr and treated with ASA for long periods	●	●	●	X	●	●	●	●	●	●	●	●	●
HIV infection	●	●	●	X	●	●	●	●	●	●	●	●	●
High risk of influenza complications, embarking on foreign travel	X	X	X	X	X	X	●	X	●	●	●	X	X
Workers with significant contact with those at risk in:													
1. Hospitals	❍	X	X	X	●	●	●	❍	●	●	●	X	●
2. LTC facilities	❍	●	X	X	●	●	●	❍	●	●	●	X	X
3. Other health-care settings	❍	X	X	X	●	●	●	❍	●	●	●	X	X
Other staff in:													
1. Hospitals	❍	X	X	X	●	●	●	X	X	●	●	X	X
2. LTC facilities	❍	●	X	X	●	●	●	X	X	●	●	X	X
3. Other health-care settings	❍	X	X	X	●	●	●	X	X	●	●	X	X
Household contacts of those who cannot be vaccinated	X	●	X	X	●	❍	●	X	●	●	●	X	X
Essential service workers	X	X	X	X	X	●	X	X	X	X	●	X	X

● Risk group is covered by a publicly funded program
❍ Planned expansion of program to include group
X Risk group not covered
* ≥ 55

Source: Squires SG, Pelletier L. (2000). Publicly-funded influenza and pneumococcal immunization programs in Canada: A progress report. *Canadian Communicable Disease Report,* 26(17), 141-148.

Syphilis: The Promise and the Threat

Not long ago, Canadian public health experts wrote encouragingly about the possibility of eliminating the local transmission of syphilis.[30] The number of new cases had been falling in Canada since the 1940s. The national rate was between 0.4 and 0.6 per 100,000 population between 1994 and 2000.[31] These trends, along with the characteristics of the disease and the availability of effective treatment, offered hope that syphilis could be the first sexually transmitted disease to be eliminated, they argued.

But the threat is not yet gone. Projections, based on the first nine months of data, suggest a resurgence in 2001, possibly up to 0.9 per 100,000.[31] Rates are up for both men and women. There have been a number of recent local outbreaks in different parts of the country, including one associated with the sex trade in Vancouver's downtown eastside that started in mid-1997. In spite of many initiatives by public health authorities, the number of reported infectious syphilis cases in BC in 2001 (177) was almost 10 times higher than the 18 cases reported in 1996.[32]

Women's Health: Screening for Breast and Cervical Cancer

The premise of most screening programs is simple—catch a disease or the presence of its risk factors early and prevention or treatment may be more effective. In some cases, it may be possible to prevent a disease entirely, or at least to significantly reduce its effects.

In some cases, screening makes sense. In others, it is not appropriate. The balance depends on how common the condition is in the target population, how likely the test is to detect it when it is present and not otherwise, whether effective prevention or treatment strategies exist, and much more.

The Canadian Task Force on Preventive Health Care weighs the evidence on what should—and should not—be included in regular checkups for Canadians of different ages. Two areas where they recommend routine screening are cervical and breast cancer.

About 1,400 new cases of **cervical cancer** will be diagnosed in Canada this year.[33] That's about 7.8 cases per 100,000 Canadian women, down from 9.6 a decade earlier and 12.3 in 1982. Changes in a number of risk factors, such as smoking and sexual behaviours, may have contributed to this trend.

Pap smears test a sample of cervical cells for abnormalities. They are designed to catch pre-cancerous and cancerous conditions early to facilitate treatment. The Canadian Task Force on Preventive Health Care recommends regular pap smears for women from when they become sexually active or turn 18 (whichever is earlier) until age 69.

Breast cancer is the most frequently diagnosed cancer among Canadian women.[33] Almost one in ten is likely to develop breast cancer in her lifetime, and one in 26 is expected to die from it.[34]

First used in clinical practice in 1927, mammography or breast imaging is used to identify breast abnormalities. By the 1950's and 60's, the technology was further developed so that benign breast anomalies could be distinguished from malignant breast disease.

More recent advances have led to tools that can be used for mass-screening programs. In 1988, British Columbia was the first province to implement an organized screening program for breast cancer. This type of program is now

available across the country, at least for women aged 50 to 69.

There is an on-going scientific debate about exactly who should receive regular screening for breast cancer. A number of studies suggest that mammography screening can reduce breast cancer deaths, particularly in women from age 50 to 69.[35,36,37] On the other hand, a recent review of randomized trials concluded that there was a lack of reliable evidence showing that mammography reduces overall death rates and some evidence that it may lead to more aggressive treatment.[38]

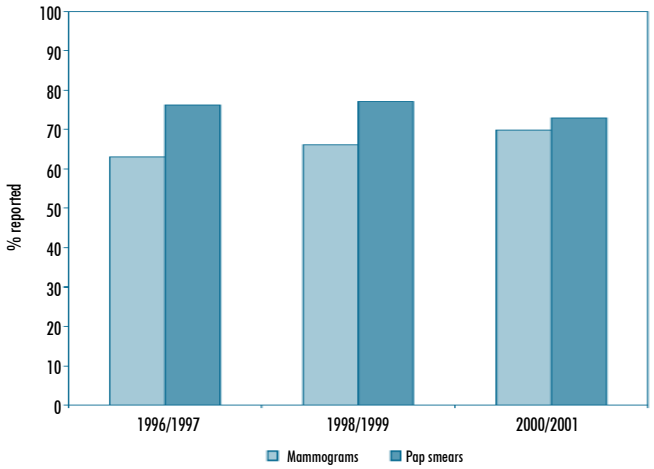
Nevertheless, a panel of experts recently convened by the World Health Organization reconfirmed its support for mammography. The experts agreed that screening could reduce the chance of dying from breast cancer among women aged 50 to 69 by about 35%.[39] The National Cancer Institute in the United States also continues to recommend that women 40 and older be screened every one to two years.[40] The Canadian Task Force on Preventive Health Care recommends routine screening for a smaller target group: women between 50 and 69 years of age.[41]

i

Pap Smear and Mammogram Rates Across the Country 58

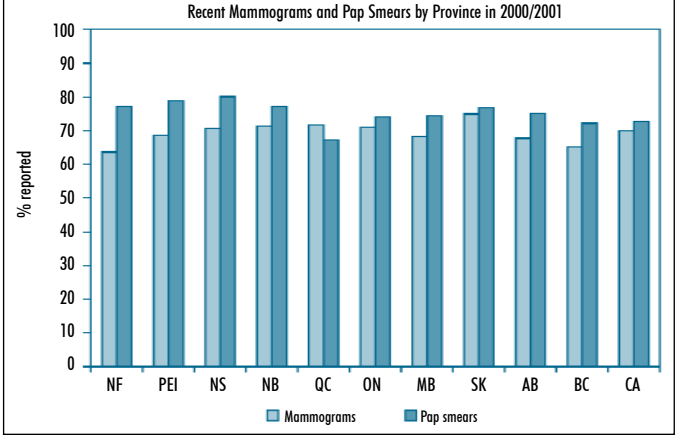
It is recommended in Canada that women aged 50 to 69 have a mammogram every two years. For Pap smears, the recommendation is every three years for women aged 18 to 69. Overall, the rates for recent mammograms are increasing. About 70% of women had a recent mammogram (for screening or other reasons) in 2000/2001, compared to 63% in 1996/1997.

Trend in Recent Mammograms and Pap Smears for Canada*



* Excludes those who answered don't know or those who did not answer to ensure comparability across years.

Recent Mammograms and Pap Smears by Province in 2000/2001



Sources: National Population Health Survey (1996/1997 & 1998/1999) and Canadian Community Health Survey (2000/2001), Statistics Canada.

Who's Being Screened?

A series of Statistics Canada surveys have asked women about their participation in cancer screening programs over several years.

The 2000/2001 Canadian Community Health Survey found the percent of women aged 50 to 69 who reported having a mammogram in the last two years for any reason was about 70%.[42] About 75% said that they received the mammogram as part of their regular check-up or routine screening. The rest had mammography for a variety of reasons including their age, family history of breast cancer, previously detected lump, and other reasons. In 2000/2001:

- More women who had a regular doctor reported getting mammograms than those who did not have a regular doctor.
- Women with higher incomes and higher levels of education were also more likely to have had a recent mammogram.

The percent of women who reported having a recent Pap smear was about 73% in 2000/2001. What makes some women get regular Pap smears and not others? In 2000/2001:

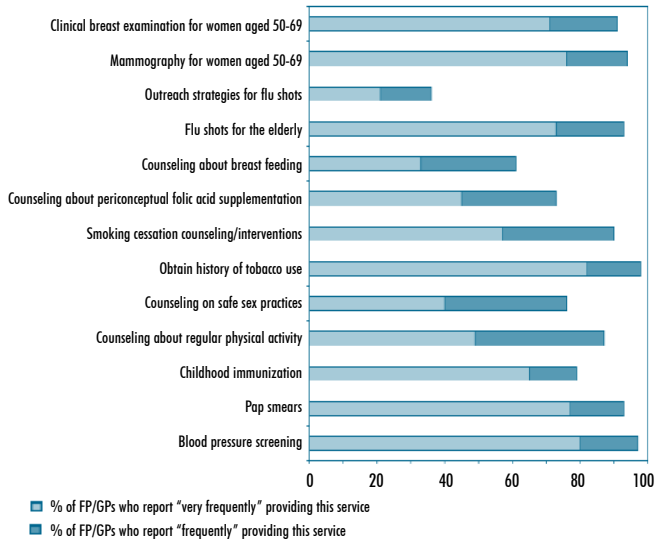
- More women who had a regular doctor had a recent Pap smear (75%) than those who did not have a regular doctor (57%).
- Older (64%) and younger (60%) women were less likely to report having a recent Pap smear than women between 25 and 54 (78%).
- Women with higher income (80%) and higher levels of education (79%) were more likely to have a recent Pap smear.

Getting the Message Out: Snapshots of Health Promotion in Canada

The choices we make can support health—or can harm it. A range of health promotion programs focus on getting the latest evidence about what helps and what hurts to Canadians. There are media campaigns designed to help reduce smoking, excessive alcohol consumption, or unhealthy eating. Other programs try to get the word out in playgrounds, schools, workplaces, doctors' offices, and elsewhere. These initiatives often involve a wide range of partners, both within and outside the traditional health care sector. Examples include governments at all levels, voluntary organizations, faith or mutual aid groups, and the business community.

Promoting Health and Preventing Illness in Doctor's Offices 59

Most family doctors responding to the 2001 National Family Physician Survey said that they frequently or very frequently provide a range of health promotion and disease prevention services to patients when needed. The degree to which particular services are provided varies somewhat, as shown below.



Source: National Family Physician Workforce Survey Database, part of the JANUS Project, College of Family Physicians of Canada.

Healthy Futures

The evidence is mounting—what happens to us early in our development can profoundly affect our health later in life.[43] For example, researchers now believe that low birth weight is related to our lifelong health and well being. As well, our risk of developing diabetes, obesity, and cardiovascular disease later in life have all been linked to factors in our developmental years.

In response, governments are dedicating significant resources to improve the health of children and their families.[44] The goal is to offer all Canadian children a solid foundation at the beginning of their lives on which to build strong, productive, and healthy futures.

Of course, governments are not alone in promoting healthy futures for Canada's children. Take, for example, the national "Back to Sleep" campaign.[45] Its goal was to reduce the incidence of sudden infant death syndrome (SIDS) or "crib death" by 10% over five years. How? The campaign aimed to increase awareness about SIDS risk factors among parents, caregivers, and health professionals. It used brochures, ads, public service announcements, messages on diaper waistbands, and other means to spread evidence-based messages.

Is the program working? It's too soon to know what has happened to SIDS death rates, but early research is available on trends in awareness and behaviours. Partners surveyed current and prospective parents before (in 1999) and after (in 2001) the campaign. Respondents in the later survey were more likely to know that infants who sleep on their backs have a lower risk of SIDS. Awareness rose from 44% to 66%. In addition, more than two-thirds of parents (69%) actually laid babies on their back to sleep, up from 41% in 1999. Lastly, researchers also found that health professionals who cared for infants were more likely to recommend a back sleeping position (67% in 2001 compared with 21% in 1999).

A Childhood Obesity Snapshot: What We Know...What We Need To Know

- Levels of obesity among children aged seven to 13 have nearly tripled in Canada over the past two decades.[46] They rose from 5% in 1981 to 16.6% in 1996 for boys and from 5% in 1981 to 14.6% in 1996 for girls.
- Canada's children are considerably more likely to be overweight than English, Scottish, and Spanish children, among others.[46]
- Childhood obesity raises the risk of adult obesity, which is linked to heart disease, diabetes, and other health problems.[47]
- Researchers have estimated that $829.4 million to $3.5 billion of Canada's health spending in 1997 was attributable to obesity.[48]
- Inactivity plays a central role in childhood obesity. Fewer than half of Canadian girls and boys are active enough to benefit health.[49]
- A growing body of evidence indicates that interventions to increase physical activity can effectively reduce obesity and prevent type 2 diabetes.[50]
- A number of strategies to prevent obesity, from infancy to adolescence and beyond, have been used. Some are multi-pronged and involve families, schools, and communities. A recent systematic review suggested that more evidence is needed to determine which of the broad range of possible strategies works best in what circumstances, not only in terms of their immediate effects on children but also their impacts on obesity and disease in adulthood.[51]

It is not possible to say definitively that the campaign caused these changes. Other programs or factors may have contributed to the trends. What we can say is that over the period that the campaign was in place, for the audience that it targeted, SIDS-related awareness and behaviours improved.

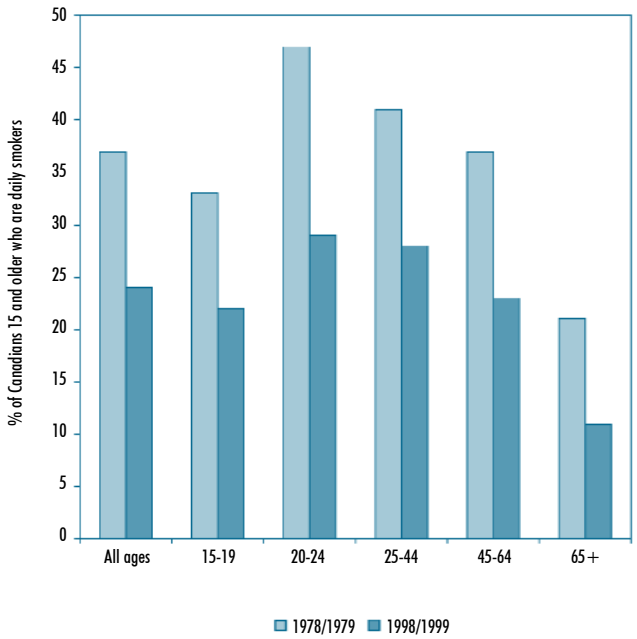
When Will You Quit?

Smoking remains one of Canada's leading public health challenges. Smoking-related diseases are a major source of illness, health care costs, lost productivity, and death.

Almost 22% of Canadians aged 12 or older said that they smoked cigarettes daily in the 2000/2001 Canadian Community Health Survey, including 13% of 12 to 19 year olds and 10% of those 65 and older. The percentage of Canadians who reported smoking daily has decreased, especially since 1978/1979. But 5.5 million of those 12 and older continue to smoke.

Canadian Smokers Then and Now **60**

According to Statistics Canada, 37% of Canadians 15 years and older reported smoking cigarettes daily in 1978/1979. In 1998/1999, only 24% of Canadians reported smoking daily.



Source: Statistics Canada. (1999). How healthy are Canadians? A Special Issue. *Health Reports*, 11(3), 83-90.

Over the years, much effort and energy has been devoted to both advertising cigarettes and to encouraging smokers to quit. A wide variety of strategies have been used to increase awareness of the health risks of smoking and to promote smoking cessation, not all of which are equally effective. Examples include requiring health messages on cigarette packages, restricting advertising, changing taxation levels, conducting public awareness campaigns, counseling from health professionals, and much more.

Cigarette Packaging Pictures **61**

Smoking cigarettes increases the risk of lung cancer, heart disease, stroke, mouth disease, bronchitis, emphysema, and even impotence. Public health programs use many strategies to encourage smoking cessation, including banning the use of "light" and "mild" labels on packaging, banning tobacco company sponsorship of cultural events, and increasing taxes on tobacco products. Recently, Health Canada has also required cigarette packaging to show large warning messages coupled with graphic pictures of damage done by smoking.

There are also many different aids to help people quit. For example, you can chew nicotine gum, wear a patch, use a nasal spray or inhaled nicotine, or take nicotine tablets or a prescription drug. The good news is that they all seem to work, to some degree. A systematic review of the literature in 2001 found that all commercially available treatments can be effective as part of a smoking cessation plan.[52] And the research continues. For example, another study published in 2001 looked at how likely people using different types of aids were to quit for at least seven days during the study period. Researchers found that quit rates were higher for those who used a nicotine patch or the prescription drug bupropion than for those who used other treatments such as nicotine gum, nicotine inhalers, hypnosis, quit smoking classes, or telephone counseling.[53]

The bad news is that some people never quit, even temporarily, and others start smoking again.

Reducing Harm: HIV Infection as an Example

HIV arrived in Canada in about 1982. Unsafe sex practices are one way that the virus is spread. Increasing the awareness of those at risk and influencing their behaviour are the focus of many health promotion activities in Canada and around the world. For example, recent media campaigns targeted at higher risk groups, such as men who have sex with other men, promoted safer sex practices. Information about HIV is also included in health education programs for teens and free condoms are frequently distributed, including to those participating in events like the Olympic Games.

HIV infection can also be spread through the use of infected needles or syringes. Of the 23,771 positive HIV tests reported to Health Canada's Centre for Infectious Disease Prevention and Control since 1985 where the risk exposure was known, almost 16% were attributable to injection drug use.[54]

Many attempts have been made to reduce the risk that HIV will be spread through injection drug use. Needle exchange programs (NEPs) are one somewhat controversial approach. They allow injection drug users to exchange used needles and/or syringes for clean sterilized ones. As of May 2001, there were approximately 200 NEPs in Canada.[55]

Opponents believe that NEPs can cause harm by creating new social networks for injection drug users, encouraging people to start injecting drugs, increasing the frequency of injecting, and increasing overall levels of drug use in a community.[56]

Proponents point to research that suggests that NEPs do not encourage drug use.[57,58] They also argue that several studies have shown that NEPs reduce the spread of HIV.[59,60,61] Further, a 2001 review of the literature found that two-thirds (28/42) of published studies showed positive effects from NEPs, such as declines in needle sharing.[62] Recent studies in Hamilton and Edmonton found that the costs of local needle exchange programs were more than offset by potential savings in health care costs.[59,60]

Coping with Emergencies

The September 11th, 2001 terrorist attacks in the United States have reinforced the awareness of importance of emergency preparedness worldwide. The public health system has an important role in designing provisions to protect us, our communities, and our environment in the face of small- and large-scale emergencies.

Who Responds?

Typically, the responsibility to respond to an emergency lies first with the affected municipalities. Depending on the scale of the emergency, provincial and territorial governments may be involved next. When they need to, they can ask the federal government for help, who can then invoke the help of the Canadian Forces if need be. The *Office of Critical Infrastructure Protection and Emergency Preparedness Canada* is the federal agency responsible for dealing with emergency situations under the *Emergencies Act*.[64] The various levels of government also work with non-governmental organizations, such as the Red Cross, when necessary.

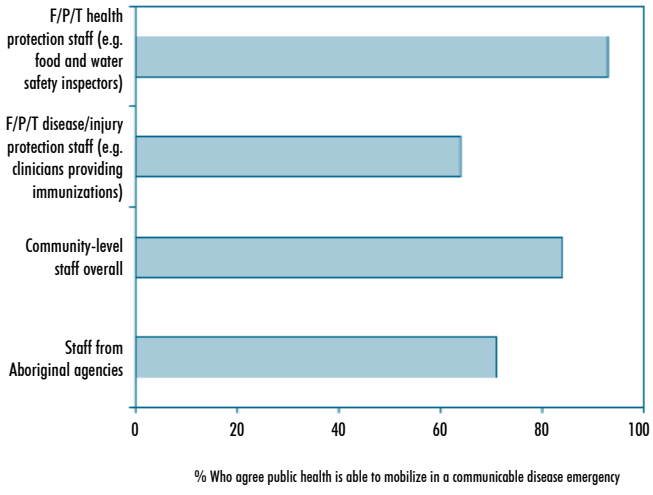
Following on the heels of the events of September 11th, many governments and organizations have recently reviewed, and in some cases strengthened, their emergency plans. For example, the federal government recently announced new funding to improve Canada's ability to effectively respond to public health crises and to chemical, biological, radiological, and nuclear incidents.[65,66]

The Capacity to Respond to a Crisis: What Public Health Officials Think

Federal, provincial, and territorial governments recently surveyed public health professionals on the capacity of our public health system to respond to ongoing, emerging, and urgent issues.[63] They identified both strengths and weaknesses in Canada's system. Strengths included the experience, knowledge, and skills of those working in public health; the system's credibility with the public; and its ability to access and mobilize resources. Weaknesses included regional differences in levels of service; lack of focus on emerging issues, such as injury and disease prevention; and public health staffing issues.

What Public Health Professionals Think 62

The ability to access and mobilize resources is very important when dealing with outbreaks of communicable disease and other public health concerns. Federal, provincial, and territorial governments commissioned a recent survey of the capacity of our public health system in 2001. Most people working in public health said they believed the system would be able to effectively mobilize in the event of a communicable disease emergency. However, confidence varies somewhat depending on who you ask, as shown below.



Source: Advisory Committee on Population Health. (2001). *Survey of Public Health Capacity in Canada, Highlights*. Report to the Federal, Provincial and Territorial Deputy Ministers of Health.

Information Gaps—Some Examples

What We Know

- Reported rates of selected communicable diseases.
- How confident Canadians are about the safety of their drinking water.
- How Canada's childhood immunization rates for DPT and measles compare to those in other countries.
- How many people receive flu shots in different parts of the country and the coverage of public funding for flu shots in each province/territory.
- Use of selected screening services (e.g. mammograms and Pap smears) by province/territory and health region.
- Self-reported rates of selected health-related behaviours (e.g. smoking, alcohol use, and physical activity).

What We Don't Know

- How many Canadians become ill each year because of unsafe food or water? What are the short- and long-term health consequences of their illnesses?
- How many children receive all recommended immunizations on schedule?
- Which among the wide variety of possible health promotion strategies, many of which aim to influence health outcomes far into the future, offer the most health gains relative to resources expended?
- How do voluntary, community, and mutual aid groups, as well as the corporate sector, contribute to health promotion, disease prevention, and health protection efforts?

What's Happening

- Canada's premiers and the prime minister agreed to track and report on the adequacy of health protection/promotion services, along with other indicators, in each of their jurisdictions by September 2002.
- The Canadian Population Health Initiative, part of CIHI, is providing funding to support both new population health research and research synthesis in a number of areas, including obesity.
- Health Canada has launched a new National Studies on Acute Gastrointestinal Illness (NSAGI) initiative to investigate the magnitude, extent of underreporting, etiology, burden of illness, and risk factors associated with gastrointestinal illness. The first phase of NSAGI will focus on getting an accurate estimate of the baseline rates of acute GI in Canada, through community-based population and physician studies, as well as public health unit and laboratory surveys.
- Development of a National Immunization Records Network, including immunization and adverse events surveillance, is underway. The aim is to have it up and running by the year 2003.

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6. Medicating Illness: Drug Use and Cost in Canada

Caffeine, cannabis, codeine, COX-2 inhibitors—the range of drugs in use today is varied and complex. Some affect the way we feel or think; others affect different organ systems or very specific parts of the body. How we obtain drugs, as well as how (and how much) we pay for them, varies almost as much as the effects that different drugs can have on our bodies. This chapter focuses on the regulation, use, and cost of prescription and non-prescription drugs across the country.

The World of Pharmaceuticals: Regulating Drugs

Prescription and over-the-counter drugs help Canadians in many ways. They can save lives, reduce the need for surgery, and allow us to maintain or improve our quality of life.[1] In some cases—such as antibiotics and insulin—new drugs revolutionized the treatment of a disease. But many medications in use today are "halfway technologies". They alleviate symptoms but do not cure or prevent the underlying condition.[2]

While many medications offer significant benefits, using drugs inappropriately can lead to health risks and costs. For example, drugs can have serious side effects and some medications are harmful when combined with other drugs or natural products. In addition, drugs are sometimes prescribed for problems better managed in other ways.[3] And new more expensive drugs are sometimes used in situations where older less expensive products would be equally effective. In addition, mistakes can occur when drugs are prescribed or taken. Some people also abuse or misuse medications. In a recent study in Atlantic Canada, for instance, 15% of adolescents who had been prescribed stimulants told researchers that they had given their drugs to others; 7% reported having sold them.[4]

Understanding and balancing the risks and benefits of drugs is not a new challenge. Canadian governments have regulated drugs for medicinal use for nearly a century. Parliament passed the *Proprietary or Patent Medicine Act* in 1908. It was a response to concerns about the potential health hazards posed by many patent medicines. This law barred certain ingredients, such as cocaine and alcohol (above set limits), from patent medicines. It also required that the ingredients of the medicine be clearly labeled on the outside of the container.[5]

Today, the *Food and Drugs Act* regulates all products marketed to treat or prevent diseases or symptoms. It covers the labeling, importing, processing, advertising, and sale of medications.[6] Under this law, Canadians must generally

obtain some drugs—such as antibiotics, narcotic pain relievers, and sleeping pills—from a licensed pharmacist with a doctor's prescription. Others, such as aspirin and cold remedies, can be bought over-the-counter.

Herbal remedies, vitamin and mineral supplements, traditional Chinese and Ayurvedic medicines, and other natural health products are also generally available without prescriptions. Health Canada created a new Natural Health Products Directorate in 1999. Its goal is to develop a regulatory framework for these products, including regulations for their licensing, production, marketing, and labeling.[7]

Marijuana: Street Drug or Medication?

With a change to the *Narcotic Control Regulations*, the medical use of marijuana became legal in Canada on July 30th, 2001. As a result, in cases where the medical benefit is expected to outweigh the risks, people with a serious and/or life-threatening illness may now be allowed to use the drug.[8] Patients must apply to Health Canada for permission to use marijuana, and their doctor must support their application in writing.[9] Health Canada granted 653 exemptions before this change; 145 new authorizations have been granted since the new regulations came into effect.[10]

How New Drugs are Born, Developed, and Approved

There were almost 22,000 drug products on Health Canada's list of drugs approved for human use in 2000.[11] Not counting biologic drug products (e.g. viral and bacterial vaccines) and controlled substances (e.g. heroin), about 5,200 were prescription drugs.

Adding new drugs to this list is a complex process,[12,13] starting with basic research. This step includes identifying new biological processes, isolating and purifying the original chemical or biological substance, and testing the drug on animals.

Suppose this "pre-clinical" testing confirms that the substance passes toxicity testing and does what it is supposed to do. The manufacturer can then ask Health Canada for permission to conduct a clinical trial. Clinical trials test whether a drug is safe and effective in humans. They typically use protocols designed to ensure sound ethical, clinical, and analytical practices.

When clinical trials are complete, the manufacturer can file a New Drug Submission with Health Canada. This submission outlines what is known about the safety, efficacy, and quality of the drug. It also describes the results of pre-clinical studies and clinical trials, as well as the drug's production, packaging, labeling, therapeutic claims, and adverse effects.

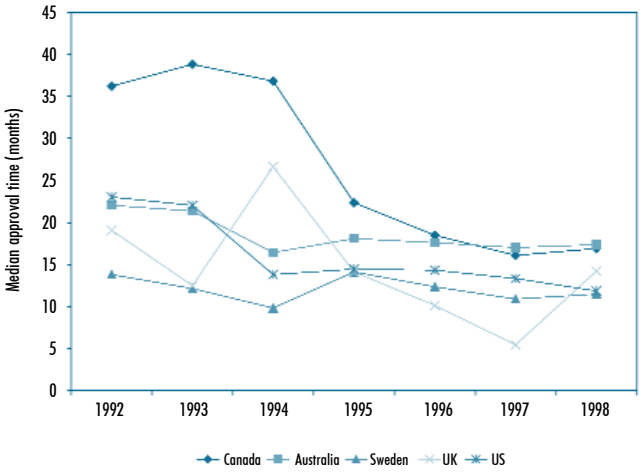
Teams of pharmaceutical and medical scientists from Health Canada, as well as external consultants and advisory committees, review new drug submissions. They evaluate the drug's potential benefits and risks. Health Canada also reviews the information that the submission's sponsor plans to provide to health professionals and consumers.

If the submission is approved, Health Canada then issues a Notice of Compliance and assigns a Drug Identification Number. This permits the sponsor to market the drug in Canada. If the submission is not approved, the manufacturer can choose to supply additional information, re-submit with more information at a later date, or appeal the government's decision.

The length of this process varies from drug to drug and year to year. Some scientists argue that the process needs to be thorough enough to properly evaluate the safety and therapeutic value of new drugs and what benefits they do, and do not, provide. Others are concerned that it should minimize unnecessary delays in approving drugs that promise major advances over existing medications.[14,15]

Watching the Clock: Drug Approval Times Compare 63

Shown below are median approval times (from the date an application was submitted to the date the product was approved) for new drugs approved in at least one of five countries between 1992 and 1998. The median approval time of the 26 drugs that were approved in Canada in 1998 was 17 months. That's about the same as in Australia, and somewhat longer than in Sweden, the United Kingdom, and the United States. Special programs exist to provide for faster approvals (e.g. for life-threatening conditions where there are not already many effective treatments on the market) and to allow for special access to drugs prior to approval (e.g. where no other therapy is available or already-approved drugs have not worked).



Source: Rawson NSB. (2000).Time required for approval of new drugs in Canada, Australia, Sweden, the United Kingdom, and the United States—in 1996–1998. Reprinted from, *Canadian Medical Association Journal*, 162(4), 501-504, by permission of the publisher ©2000 CMA.

Watching for Problems after Approval

Tragedies make for long memories. The world's experience with drugs like thalidomide continues to remind us that ongoing monitoring of the effects of drugs is important.

In some cases, testing does not identify all the problems (or all indications for which they are effective) before drugs are approved for use. Problems can occur because groups for whom safety and efficacy were not determined in the original clinical trials take the drug, because the drug may interact with other drugs or substances that patients are taking, or for many other reasons.

Thalidomide: A Case of Unanticipated Effects

Thalidomide was originally developed to treat allergies. Testing showed that it was not an effective antihistamine. But it did relieve morning sickness in the early stages of pregnancy and induce sleep. Found to be non-toxic in testing on animals, drug companies widely marketed thalidomide throughout the world in the late 1950s. By 1961, they had withdrawn it from most markets.[16]

What happened? Experts found that babies born to pregnant women who took the drug were more likely to have severe birth defects, such as malformed limbs and internal organs.[16] In Canada, about 115 children were affected.[17] That's a lower number than in many parts of Europe, Australia, South America, and elsewhere, probably because approval of the drug took longer in Canada. A Canadian, Dr. Frances Kelsey, also played a major role in preventing approval of thalidomide in the United States.[18]

In 1963, the government tightened safety standards and information requirements in an attempt to prevent similar problems in the future. But the thalidomide story is not over.[17] Researchers have recently found new uses for the drug in the treatment of leprosy and other autoimmune and inflammatory disorders, including HIV/AIDS.[16]

Health Canada does not generally require specific long-term studies to detect harmful effects of drugs. Instead, 'post-marketing surveillance' of drugs—gathering information about potential problems after drug approval—usually takes place in other ways. For example, under the *Food and Drug Act*, drug manufacturers must tell Health Canada about any serious adverse drug reactions that they become aware of.[19,20]

Health Canada also has "passive" systems to monitor drugs. They encourage, but do not require, physicians, pharmacists, and other health professionals to report major or minor undesirable effects experienced by consumers.[19]

What happens when problems are found? The government directs most information about suspected or proven adverse drug reactions to physicians and other health professionals.[19] For example,

Health Canada publishes safety alerts about medications in the *Canadian Adverse Drug Reaction Newsletter*.

Increasingly, consumers are also using the Internet and other means to access information about the adverse effects of drugs.[21] For example, the Canadian Diabetes Association's Web site discusses issues surrounding animal and human insulin.[22] Using recombinant DNA technology, scientists were able to produce a new form of insulin that is chemically identical to insulin produced by the human pancreas.[23] This 'human' insulin therefore reduces the chance of allergic reactions that some people experience when using insulin made from animal sources. As use of human insulin became widespread in the 1990s, some people reported problems identifying their hypoglycemia (low blood sugar) when they switched from animal insulin to the new product.[24] In a recent review of the evidence, researchers concluded that studies have failed to show that treatment with human insulin *per se* affects the frequency or awareness of hypoglycemia.[25] Today, people who require insulin are usually started on human insulin and thus avoid having to switch from one form to the other. Because some uncertainty about safety remains, care providers closely monitor those who switch from animal to human insulin, and insulin made from animal sources continues to be available.[22]

Why Do Some Drugs Require a Prescription?

Over-the-counter drugs such as aspirin are legally available without a prescription but may be prescribed. Usually, consumers pay directly for over-the-counter drugs, although, when prescribed, they may sometimes be covered by public and private drug plans. Other drugs require a prescription. Private insurance plans or public programs often cover the cost of these drugs.

Drugs can be two-edged swords. Taken for the right reasons and in the proper dosage, they can be very helpful, even life-saving. But often, it requires a health professional's extensive knowledge and expertise to select the drug(s) best suited to the condition(s) of the patient; taking drugs in combination may cause harm; and effectiveness is dependent on taking the right drugs for the right length of time. As a result, manufacturers or others can request that a particular drug be available over-the-counter or require a prescription. Ultimately, Health Canada makes the decision. Whether a particular drug requires a prescription can vary from country to country.

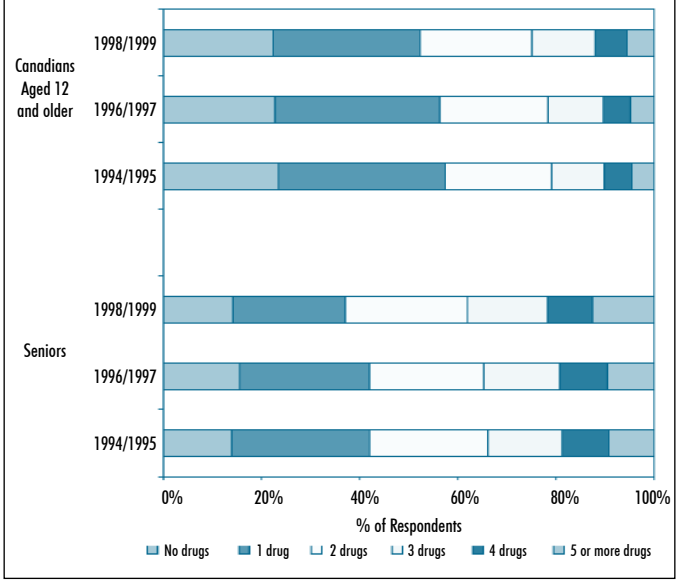
According to the World Health Organization (WHO), there are pros and cons to having medications available to consumers without a prescription.[26] WHO suggests that self-medication may reduce pressures on the health care system. But they say that it may also lead to delays in seeking needed care. In addition, consumers may think that drugs available without a prescription are harmless. WHO argues that this may result in excessive and potentially dangerous levels of use.

Who Takes What Medication?

Millions of Canadians take drugs daily. Most fill at least one prescription each year. The 1998/1999 National Population Health Survey asked Canadians aged 12 and over about their medication use. Nearly eight in ten respondents (78%) said that they had used one or more prescribed or over-the-counter medications in the last month. Women and older Canadians were more likely to report using medications than others were. Low-income Canadians also tended to report higher use of many medications. Painkillers and allergy medication were exceptions.

Who Is Taking Medications? 64

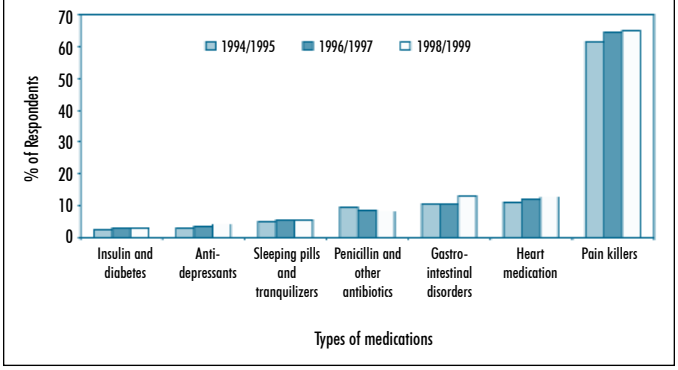
Most Canadians report having taken at least one prescribed or non-prescribed drug in the last month. Many report using multiple drugs. The graph below shows the percent of all Canadians aged 12 and older (top 3 bars) and seniors (bottom 3 bars) who reported using different numbers of prescribed and non-prescribed drugs in the last month. Multiple medication use is more common for seniors, and the proportion of seniors that report using five or more drugs is increasing.



Source: National Population Health Survey, Statistics Canada

Trends in the Use of Different Drugs 65

Canadians' use of different types of drugs has changed over time. The graph below shows the percentage aged 12 and older who reported taking different types of commonly-used prescribed or non-prescribed drugs in the past month. Rates are not adjusted for differences in the age and sex composition of the population over time.



Source: National Population Health Survey, Statistics Canada

Painkillers—ranging from aspirin to morphine—are among the most commonly used drugs. About 65% of Canadians said they had taken painkillers in the last month. Other commonly used drugs include heart medications (13%), stomach remedies (13%), penicillin or other antibiotics (8%), sleeping pills and tranquilizers (5%), and antidepressants (4%).

Top Selling Drugs Around the World 66

Given the different names under which they are sold, doses used, prices paid, and regulations in place, international comparisons of drug use and sales are difficult. The chart below compares the top 7 selling groups of drugs in Canada's retail pharmacies with their ranks in 8 other countries in 2001.

Therapeutic Group	Canada	US†	Japan‡	Germany	France	Italy	UK	Brazil	Mexico
Cardiovascular	1	2	1	1	1	1	1	3	5
Central Nervous System**	2	1	8	3	2	3	2	2	3
Alimentary/Metabolism	3	3	2	2	3	2	3	1	1
Respiratory	4	4	5	4	5	5	4	5	4
Musculo-Skeletal	5	7	7	8	7	6	6	6	7
Anti-Infectives	6	5	3	5	4	4	7	7	2
Genito-Urinary	7	6	15	6	6	7	5	4	6

** Includes pain killers
† Includes sales through mail order channels
‡ Includes sales to hospitals

Source: IMS Health, 2001.

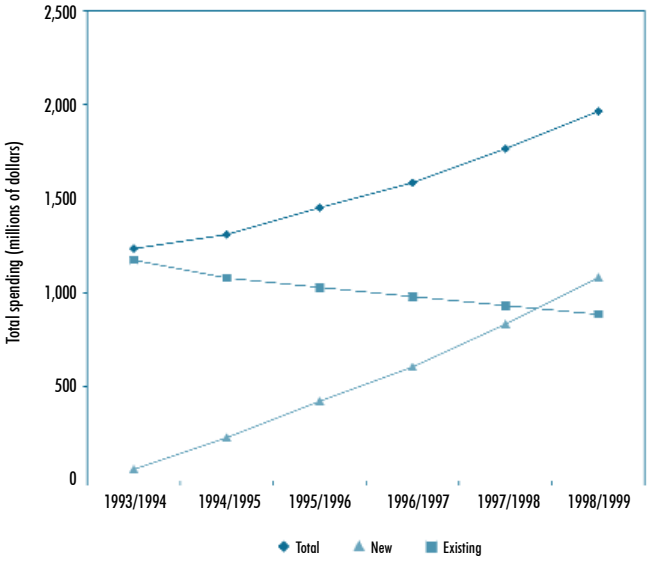
Old or New? Choices to be Made When Prescribing

New drugs are introduced each year. In some cases, they are better than older drugs, perhaps because they are more effective, are easier to use, or have fewer side effects. For example, recent advances offer new ways of treating peptic ulcer disease, high blood pressure, AIDS, erectile dysfunction, depression, and other conditions.[1] But newer drugs may also be more expensive than older ones and are not always the best choice for particular patients. For example, a study showed that in Manitoba between 1995 and 1998,[27]

the number of prescriptions for newer broad-spectrum antibiotics grew relative to prescriptions for older antibiotics. The increase occurred even though broad-spectrum antibiotics are more expensive and their widespread use may increase the risks of antibiotic resistant organisms.[27]

Public Spending: New Drugs Take Over **67**

By 1998/1999, provincial drug plans in Ontario, Saskatchewan, Alberta, and British Columbia were paying more, in total, for drugs introduced after 1991/1992 ("newer" drugs) than for older ("existing") drugs. Between 1993/1994 and 1998/1999, total drug expenditures climbed, while spending on existing drugs decreased.



Source: Federal/Provincial/Territorial Working Group on Drug Prices. (2000). Cost Driver Analysis of Provincial Drug Plans, Ontario, Saskatchewan, Alberta, British Columbia.
www.hc-sc.gc.ca/english/feature/fpt2001/pdf/cost_drivers/british_columbia_cost_driver.pdf
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Use of New Heartburn Medications

First introduced in 1989, proton pump inhibitors (PPIs) reduce the amount of acid in the stomach. They are used to treat peptic ulcer disease and gastroesophageal reflux, a serious disorder that causes persistent heartburn and abdominal pain.

These symptoms are common and may or may not be associated with a serious disorder. Older, less expensive, drugs that reduce stomach acid and relieve heartburn are also available. As a result, some argue that overuse of PPIs to treat symptoms associated with minor problems is unnecessarily costly.[28] Some jurisdictions restrict access to these drugs through public drug plans. For instance, Ontario has a "step-up" policy which lists PPIs as "limited use" drugs. Patients will only be reimbursed if they have a confirmed serious disorder or after an unsuccessful 8-week trial of a less expensive medication.[29]

The Terms of Patent

In Canada, many new drugs are eligible for patent protection. The holder of the patent has the exclusive right to make, sell, or otherwise exploit the invention for a limited period of time. Most (about 96% in 2000) patented drug products require a prescription.[30]

Canada has periodically changed the duration of drug patents and the conditions attached to them. For example, *Bill* C-22—passed in 1987—extended the minimum term from 17 to 20 years for *new* patents. A recent amendment to the Bill extended the minimum 20-year standard to any non-expired patent that had a term of less than 20 years.[31]

At the same time as Bill C-22 was passed, the government created the Patented Medicine Prices Review Board (PMPRB). The Board aims to ensure that prices charged for patented medicines are not excessive. Among other things, PMPRB regulates the prices set by manufacturers for patented prescription and non-prescription drugs. They do not, however, control prices charged by wholesalers, retailers, or pharmacists' fees. Nor do they regulate the prices of drugs that are not under patent.[32]

Under the *Patent Act*, prices for *existing* drugs cannot increase more than the consumer price index each year. Also, the cost of *new* patented drugs must fall within the range of existing drugs to treat the same condition. Costs for *breakthrough* drugs—those that offer a substantial improvement over existing drugs—cannot be set higher than the median cost in seven countries used for comparison.[32] *

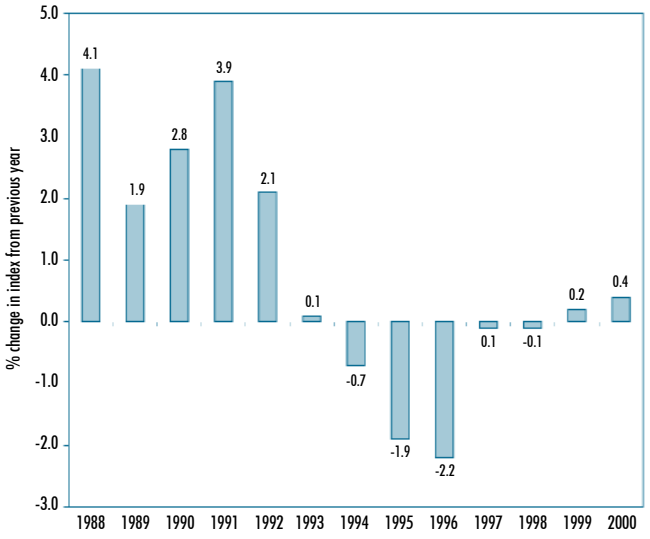
* For these comparisons, the PMPRB uses a method different from the method in the other six countries to calculate drug prices in the United States because many buyers in the United States are able to negotiate confidential discounts.[30]

Overall, patented medicine prices have increased by less than the consumer price index each year since 1988, except 1992, according to PMPRB.[30]

What about drugs that are not under patent? In 1999, governments across the country conducted a study of 72 top-selling non-patented drugs with a single Canadian source.[33] Researchers compared prices for these drugs paid by government drug plans in Ontario and British Columbia with those in the seven countries used by PMPRB to compare prices of patented drugs. They found that the median prices of the drugs in Canada were, on average, 30% higher than those in the other countries. But our prices were generally lower than those in the United States. Consumers south of the border paid 96% more, on average, than Canadians for the products included in the comparisons.

Ups and Downs in the Prices of Patented Medicines 68

The graph below shows the average change in the average (ex-factory) price of patented drugs sold in Canada between 1988 and 2000. After several years of increases, average prices for patented drugs decreased beginning in 1994. They began to increase slightly beginning in 1999.



Note: beginning in 1999, the PMPI reflects changes in the prices of patented drugs for human use only.

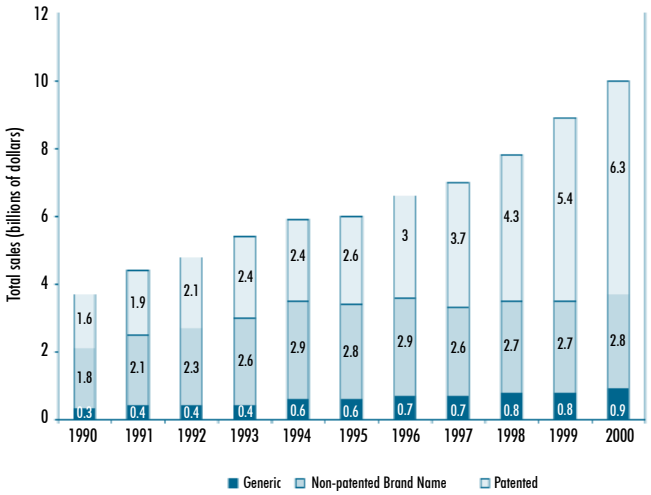
Source: Patented Medicines Prices Review Board, Annual Report, 2000.

Dividing the Market: Brand Name and Generic Sales

In 2000, manufacturers sold about $6.3 billion of patented medicines in Canada, according to the Patented Medicine Price Review Board (PMPRB).[30] That's just under two-thirds (63%) of total drug sales across the country, up from 43.3% in 1995. PMPRB suggests that, in part, the long-term effects of extended patent protection may explain this increase.

Changing Shares of Sales 69

The value of sales of patented drugs has grown in recent years, while sales of non-patented and generic drugs have stayed relatively stable. The chart below shows total sales of generic, non-patented brand-name, and patented drugs in billions of dollars between 1990 and 2000. As of 1999, figures include sales of drugs for human use only. Figures are not adjusted for inflation.



Source: Patented Medicines Prices Review Board, Annual Report, 2000.

Most of the remaining sales (28%) were non-patented brand-name drugs sold by companies that also sell patented drugs. "Generic" drugs—copies of drugs for which the original patent(s) have expired—accounted for about 9% of sales in 2000. These drugs are often marketed by more than one manufacturer.

How Much are We Spending?

Retail drug sales became the second largest category of total health spending (after hospitals) in 1997, overtaking physician services. In total, Canadians are expected to have spent over $15.5 billion on drugs in 2001, up 8.6% from the previous year.[34] That is just over $500 per person.

In Canada, both the public and private sectors pay part of the drug bill. Public sector payers include governments, Workers' Compensation Boards, and other social security schemes.

The federal government pays for prescribed drugs for the military, the Royal Canadian Mounted Police, veterans, inmates in federal jails, and Status Indians and Inuit when these costs are not covered by other insurance plans.[32] Provincial/territorial governments pay for drugs given to patients in hospitals across the country.

Where Canada Stands

Canada spends more per person on drugs than most other countries. As of 1997, only four of the 25 OECD countries who reported spending on drugs dispensed to outpatients* paid more per person than Canada (figures were adjusted for differences in purchasing power between countries).[35] We spent less per person than France, the United States, Japan, and Belgium.

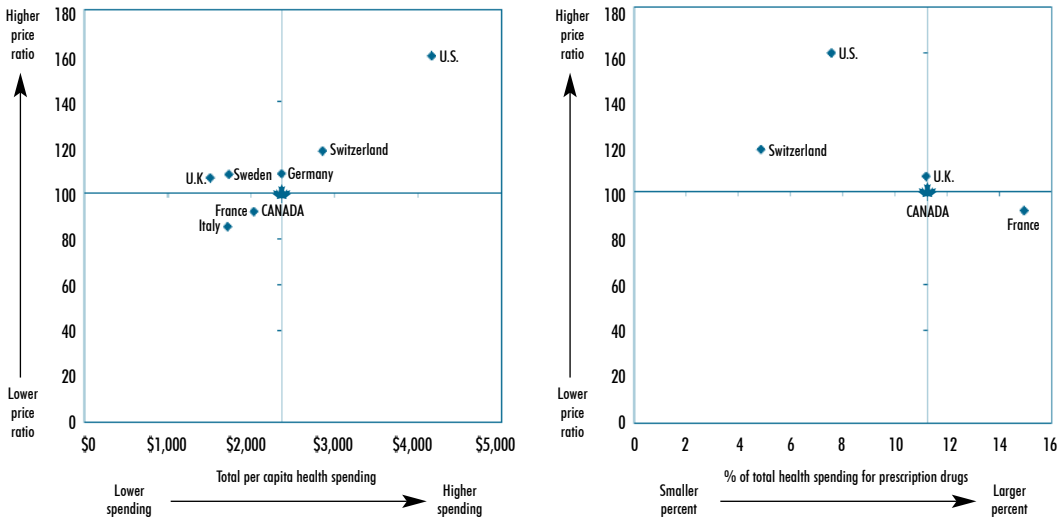
There are many reasons why spending on drugs or on health care varies from country to country. One possible explanation is differences in drug prices. Each year, the Patented Medicine Prices Review Board compares Canadian prices for drugs under patent to those in seven other countries. In this group, countries with higher drug prices in 1998 tended to spend more in total (public and private) on health care per person (see left graph below). But they also tended to spend a smaller share of this total amount on drugs (see right graph below).

Both graphs show an index of patented drug prices in Canada compared with the other countries. A value of 100 means that, overall, prices for the basket of drugs considered were the same as those in Canada. The lines across the charts are at this level. Countries with points above this line tended to have higher prices than Canada. Those below had lower prices.

Drug Prices and the Share of Health Care Spending 70

The cost for a particular basket of drugs can be different in different countries. The average foreign to Canadian price ratio is an index of patented drug prices in Canada and other countries. In countries where the same basket of drugs would be more expensive than in Canada (like the US), the ratio is higher than 100. In countries where the same basket of drugs would be less expensive (like Italy) the ratio is lower than 100.

For the most part, where the index is relatively high, drugs cost more and more money is spent per capita on health (see left below). But higher drug costs don't necessarily mean higher drug spending (see right below) Note that only a few countries are shown on these graphs, and that each country may have a different way of calculating the percent of total health spending for prescription drugs. Comparisons should be interpreted cautiously.



Notes: Data are from 1998.
Per capita spending estimates are adjusted for differences in purchasing power between countries.
Spending on prescription drugs in UK from 1997 (not available for 1998).

Source: OECD Health Data, 2001; Patented Medicine Prices Review Board, 1998

* Includes spending on "medical non-durables", such as orthopaedic and surgical appliances, since these expenditures were not reported separately by many countries.

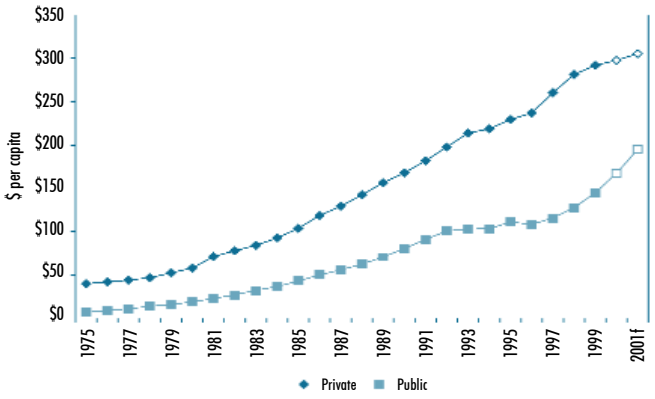
They also have a variety of programs that cover parts of the total drug bill. In addition, income-related tax credits partly offset a range of medical expenses, including prescription drugs.

Individual Canadians also pay some drug costs out of their own pockets. Private insurance, often provided through the workplace, is the other major private sector payer.

The public/private split of drug spending is gradually changing. In 2001, 61% of retail drug sales (about $300 per person) were paid for by private sources. That compares with 85% in 1975. Between 2000 and 2001, CIHI estimates that public sector spending grew more than four times faster (over 16%) than private sector spending (just under 3%).

Public versus Private Drug Spending 71

Public and private per capita spending on retail drugs, unadjusted for inflation, has risen steadily since 1975. Between 2000 and 2001, public sector drug spending is estimated to have increased by over 16%, compared to just under 3% for private sector spending.



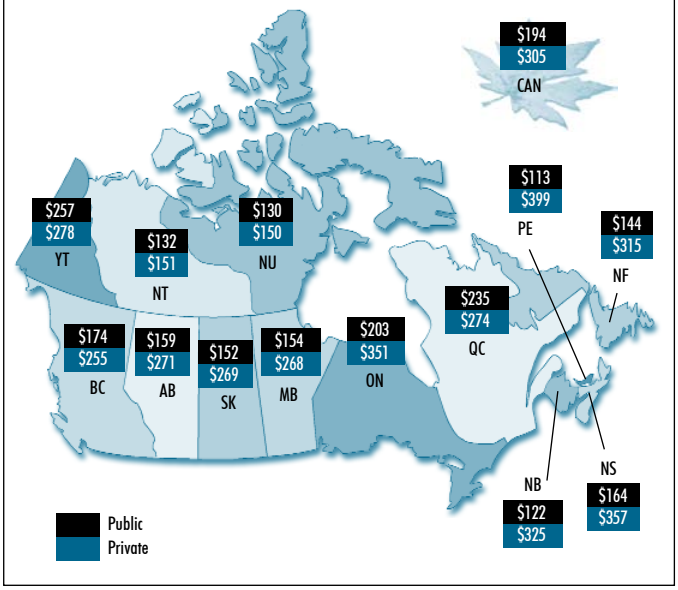
Note: Open symbols are forecast figures.

Source: National Health Expenditure Database, CIHI.

Within the overall trend, the mix of drug spending continues to vary significantly across the country. In 2001, the public share ranged from 22% in Prince Edward Island to 48% in the Yukon Territories. In part, this may be explained by variations in private and government insurance coverage.

Drug Spending From Coast to Coast 72

In 2001, public and private sector payers in Canada spent an average of just over $500 per person on retail drug sales. The private share varied from $150 per person in Nunavut to $399 in Prince Edward Island.



Source: National Health Expenditure Database, CIHI.

Whose Drug Costs are Insured?

Three-quarters (75%) of Canadians aged 12 and older reported some public or private insurance coverage (with varying levels of deductibles) for prescription drugs in 1998/1999. Young adults and low income Canadians were least likely to say that they were insured. In part, this likely reflects the fact that private insurance is often a benefit of employment, covering employees and their dependents.

Who Has Insurance Coverage? 73

In 1998/1999, Canadians with the lowest levels of education and income were least likely to report having insurance for prescription drugs than those with the highest levels. The tables below show the proportion of Canadians aged 12 and older by education and income levels who reported having insurance for drugs in that year.

Education Level	%
Less than high school	71%
High school	72%
College	74%
University	80%

Income Level	%
Lowest income	58%
Lower middle income	66%
Upper middle income	80%
Highest income	87%
Not stated	73%

Source: National Population Health Survey, Statistics Canada

Each province and territory has developed its own publicly funded drug plan(s). As a result, families with similar incomes and medical needs may receive very different government-funded benefits depending on where they live.

Persons receiving social assistance are covered in all provinces and territories, but program benefits vary. Most government plans also cover seniors (although coverage is based on income in some provinces). Some government drug plans also cover persons with specific diseases—such as HIV/AIDS, cancer, and diabetes—who often require expensive drug therapy. The diseases that qualify for coverage vary across the country.

Most public plans require clients to share part of the cost of their drugs through deductibles and/or co-payments. These requirements differ across the country. For example, public drug plans cover all residents of Saskatchewan, British Columbia, and Manitoba, but residents must pay relatively high deductibles. Likewise, all residents without private insurance are covered under public plans in Quebec, but most Quebec residents must pay a monthly deductible.

Which drugs are covered by public drug plans also varies.[36,37] Some drugs appear on all provincial/territorial "formularies"—lists of drugs eligible for reimbursement. Others are covered only in selected jurisdictions. The conditions under which particular drugs are covered may also vary.

Many factors influence coverage decisions for drugs. For example, groups like the Canadian Council on Health Technology Assessment aim to help governments weigh the potential costs and value of new technologies, including new drugs. They use sophisticated guidelines and tools to compare the dollar costs,

Who is Eligible for Coverage? 74

Coverage of provincial/territorial drug plans varies across the country. The chart below shows that eligible groups differ. Co-payments and deductibles also vary. A co-payment is the share of the cost of a prescription (Rx) that a patient must pay. For example, they may be required to pay $4.00 per prescription or 20% of the cost for each prescription. A deductible is an amount that a patient must pay, often on a yearly basis, before insurance payments begin. It is usually subtracted from the amount that patients are reimbursed on their first claims in each calendar year.

Province/ territory	Health Service Drug Programs	Social Service Drug Programs
NF	Residents 65 and over in receipt of the GIS*	Social assistance recipients & those who cannot pay (as determined by a social worker)
PEI	Persons 65 & over and residents of government operated or subsidized nursing homes	Family Health Benefit Program, Financial Assistance Program, and Children in Care Program
NS	Residents 65 & over registered with Medical Services Insurance program who have no other coverage	Family benefits and social assistance recipients
NB	Persons 65 & over registered with New Brunswick Medicare, who receive the GIS* or who qualify under an income test, residents in licensed nursing homes	Persons and eligible dependents with a valid health services card with financial need as determined by Human Resources Development, New Brunswick
QC	All residents without access to a group drug plan (usually through employer) or other public plan	Employment assistance recipients
ON	Persons 65 & over, residents of long-term care or special care facilities, or persons receiving Home Care benefits	Social assistance recipients, Trillium Drug Program** recipients
MB	All residents	Employment and Income Assistance participants and children in care
SK	All residents with no other coverage	Social assistance recipients, residents of long-term care or special-care homes, Family Health Benefits recipients, Saskatchewan Income Plan, seniors receiving Guaranteed Income Supplement
AB	Prescription drugs covered under private plans or an optional Blue Cross plan administered by the provincial government; seniors can purchase additional coverage	Subsidized premiums under the Alberta Health Care Insurance Plan available for low income residents; Alberta Child Health Benefit for children living in families with low incomes
BC	All residents	Social assistance recipients
YT	All residents 65 & over and their spouses 60 and over not covered by private insurance	People with chronic conditions, serious functional disabilities, children in low income families
NWT	Métis and non-natives 60 and over	Income assistance

Notes: Information for Nunavut is not included in this table.

* Guaranteed Income Supplement
**Available for all Ontario residents who have high drug costs in relation to income.

Source: Compiled by CIHI.

efficacy of treatment, potential number and quality of life years gained, and other factors for new drugs with those for other ways of treating a particular condition. In practice, however, a recent review highlighted the importance of factors beyond cost-effectiveness in the decision-making process.[37]

Which Drugs are Covered Depends on Where You Live

More than 2 million Canadians have diabetes. Although diet and exercise are the mainstay of therapy, some people with diabetes require specific medication and medical supplies to manage their illness. For those with private insurance, these drugs and supplies may be covered under supplementary health plans. For those without private insurance, most provincial/territorial drug plans cover some of the costs for diabetes drugs, although the extent of the coverage varies from province to province. Some provinces also provide additional coverage for people with diabetes and other conditions for which drug costs may be high. But there are variations in which drugs are covered.

To illustrate the differences, the Canadian Diabetes Association, in partnership with the Association Diabète Québec, recently summarized which provinces cover which diabetes drugs under the provincial drug plan.

What's on Whose Formulary 75

Provinces/territories develop lists of drugs, known as formularies, that their plans cover. Some drugs are covered in all jurisdictions. Others vary. In some cases, drugs have "restricted" status, limiting coverage to particular types of patients or situations. The chart below shows which provinces typically covered insulin and nine specific diabetes drugs on their formularies. A check mark indicates coverage, "X" indicates no coverage, "R" indicates restricted status.

Brand Name (Drug name)	NF	PEI	NS*	NB	QC	ON	MB	SK	AB	BC
Actos (Pioglitazone)	X	X	X	R	R	X	X	R	R	X
Avandia (Rosiglitazone)	R	X	X	R	R	X	X	R	R	X
Diabeta (Glyburide)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Diabinese (Chlorproramide)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Diamicron (Gliclazide)	✓	X	✓	X	R	X	X	X	✓	R
GlucoNorm (Repaglinide)	R	X	X	R	R	X	X	R		X
Glucophage (Metformin)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Insulin	✓	✓	X	✓	✓	✓	✓	✓	✓	✓
Orinase (Tolbutamide)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prandase (Arcarbose)	R	X	✓	R	✓	R	✓	✓	✓	✓

Source: *Diabetes Report Card 2001*, Canadian Diabetes Association, www.diabetes.ca/news/reportcard/cda_report_card.pdf, updated by CIHI based on information provided by provinces.
*as of September 2001, more recent update not available

Why is Drug Spending Rising?

Canada's drug bill has been steadily rising in recent years. In 2001, we are forecast to have spent more than twice as much per person on retail drug sales than they did in 1990 (unadjusted for inflation).

Researchers agree that this increase reflects many different trends. For example, the PMPRB recently compiled the following list of factors affecting drug spending:[30]

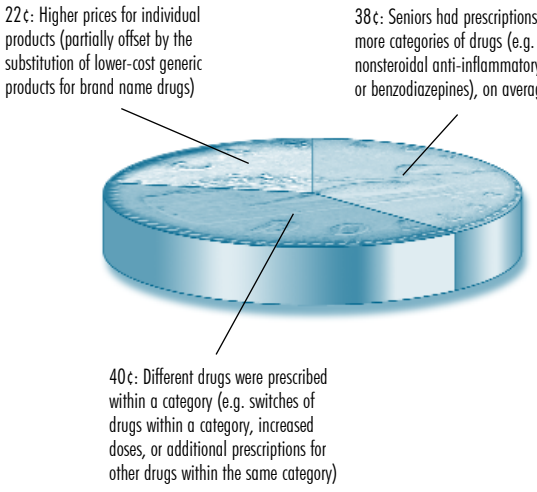
- Changes in the size of the total population
- Changes in population demographics and health status
- Changes in the unit prices of patented and non-patented drugs
- Changes in retail and wholesale mark-ups and professional fees
- Changes in the prescribing habits of physicians (e.g. from older, less expensive medication to newer, relatively more expensive medications to treat the same underlying condition)
- Changes in utilization of drugs on a per patient basis (e.g. more medications per patient per year)
- Trends towards using drug therapies instead of other treatments (e.g. as alternatives to surgery in some cases)
- Emergence of new diseases for which there are drug treatments
- Persistence of old diseases for which there are now drug treatments (where none existed before or where they can be better treated with new drugs).

Many studies are underway to determine which factors matter most and how they affect overall spending on drugs. For example, Steve Morgan at the University of British Columbia recently studied 64 million prescriptions dispensed to seniors in British Columbia between 1987 and 1999.[40] These prescriptions were covered by the province's Pharmacare plan A.

Over this period, the average number of prescriptions per person grew by 15%. Drug costs per person, however, jumped almost 150% ($192 to $479), even though there was relatively little price inflation over this period. Increased use of newer drugs explains part of this growth. Drugs that had existed pre-1986 still accounted for over half (59%) of all prescriptions in 1999, but they represented only 22% of spending in that year.

What Explains BC's Rising Drug Bill 76

In another study of prescriptions dispensed to seniors under British Columbia's Pharmacare Plan, Steve Morgan looked at what explained the jump in average drug costs per person between 1985 and 1999. He found that three major factors drove increases over this period. Their relative importance is shown below.



Source: Morgan S. (2002). Quantifying components of drug expenditure inflation: The British Columbia Seniors' Drug Benefit Program. *Health Services Research (HSR)*, in print.

Another researcher with British Columbia's Pharmacare Program showed that average costs of newly introduced prescription drugs have increased over time.[41] He showed that the average cost of prescriptions in British Columbia for drugs that came on the market before 1986 increased from $17.15 in 1985 to $25.17 in 2000, generally in keeping with inflation. The average cost of new drugs, however, has increased steadily over time, in excess of what would be expected on the basis of inflation alone. New drugs introduced between 1998 and 2000, for example, cost, on average, $114.41 per prescription in 2000.

Does Direct-to-Consumer Advertising of Drugs Matter?

Unlike in the United States and New Zealand, drug companies are forbidden to market prescription drugs directly to Canadian consumers.[42] Ads that include the drug's name, price, and quantity and indirect ads are, however, allowed. The latter include, for example, ads whose primary purpose is not to promote drug sales, that do not identify specific drugs, that offer disease awareness or help-seeking messages, or that promote a company rather than a specific drug.

Direct-to-consumer advertising of prescription drugs (DTCA) is controversial.[43] Proponents claim that it may educate and empower consumers, improve compliance with drug therapy, and promote earlier use of drugs (possibly contributing to better health and/or reduced hospitalization costs). Opponents maintain that exposure to DTCA and the availability of similar information on the Internet can contribute to inappropriate prescribing, rising drug costs, and potential harm to the patient and to the doctor/patient relationship. Others argue that because drugs are advertised on cable TV and the Internet, to which Canadians have access, regulating DTCA is increasingly difficult.

A recent study[43] found that DTCA may have an impact on consumer behavior, prescribing patterns, and costs, even in Canada. The authors compared the behaviour and opinions of 78 physicians and 1,431 patients in Sacramento and Vancouver. Most patients in both centres (including 90% of those in Vancouver) reported having seen prescription drug ads. Nevertheless, Sacramento patients were more likely to request one or more drugs during their consultations (15.8% versus 9.0%), particularly advertised drugs (7.3% versus 3.2%).

In most cases, physicians prescribed requested drugs (79.6% in Sacramento compared with 62.6% in Vancouver),[43] even though they said that they would not necessarily prescribe that drug to another patient with the same complaint who had not requested the drug by name.[43] In 50% of cases where patients requested an advertised drug, physicians reported being ambivalent about the choice of treatment. That compares with 12.4% of cases where prescriptions were not requested by patients.

Information Gaps—Some Examples

What We Know

- Most Canadians use some form of prescription or non-prescription medication over the course of a year.
- Public and private spending on drugs has increased every year since at least 1975 (unadjusted for inflation).
- Eligibility criteria, benefit levels, and coverage provided by provincial/territorial drug programs vary.

What We Don't Know

- What has been the total impact of extended patent protection on drug utilization, costs, and patient outcomes?
- What strategies are most effective in controlling costs and increases in utilization, while ensuring high quality patient care?
- Are the drivers of recent increases in spending on drugs the same across the country?
- What approaches help patients and their caregivers to maximize the benefits of medications while minimizing risks?

What's Happening

- CIHI and the Canadian Institutes of Health Research (CIHR) are jointly funding research to determine the extent of adverse events in Canadian hospitals—including medication errors—and to explore the development of strategies to monitor and reduce these events.
- CIHI and the Patented Medicine Prices Review Board (PMPRB) are working together to develop a pan-Canadian prescription drug utilization information system.
- At their January 2002 conference, premiers agreed to start a common review process for new drugs to be covered under provincial/territorial drug plans and to work together to streamline the approval process for generic drugs.[44]

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Part C: A Look Ahead

7. Conclusion

How should health services be financed, managed, and delivered? What should be done to attract, recruit, and retain the best mix of health professionals to meet a particular community's needs? What should be done to improve quality of care?

Canadians across the country are wrestling with these and many other important questions about our health care system. Commissions have been struck. Politicians debate the issues. Media stories abound. And Canadians are talking about what our system is like today and where it should be in the years to come.

We are not alone. At the international level, the World Health Organization (WHO) recently argued[1] that the goals of a health system should be:

- Improving health status
- Reducing health inequalities
- Enhancing responsiveness to legitimate expectations
- Increasing efficiency
- Protecting individuals, families, and communities from financial loss
- Enhancing fairness in the financing and delivery of health care.

The WHO then tried to measure how well different countries were meeting these goals. For its part, the Organization for Economic Cooperation and Development recently announced a three-year review of health systems in each of its 30 member countries. The aim of this exercise is to identify what countries could or should be doing to more effectively and efficiently organize and deliver health care services.

Before we can decide what *should be*, it helps to understand what *is*. That's what these annual reports, along with the companion *How healthy are Canadians?* series are all about.

Health Care in Canada 2002 compiles the latest health system data and trends—enriched by recent research findings—and highlights what we know and don't know about the country's health care system. It charts many of the changes in health care over the last decade. For example, the level and mix of spending have fluctuated over this period. The largest share ($32.2 billion) of the record $102.5 billion spent in 2001 still went to hospitals, but spending on drugs (now $15.5 billion) has exceeded spending on physician services since 1997. At the same time, overnight hospital stays are down, but day surgery use has grown. A wide range of other important changes are occurring, from increases in childhood obesity to new models for primary care and better information on health outcomes.

But not everything is changing. For example, most Canadians say that their health is very good or excellent, although differences remain within and across communities. Regional differences in factors that affect our health, in how health services are organized and used, in health outcomes, and in other areas also persist. In addition, the challenges of promoting health, preventing disease, and providing high quality care endure, although the yardsticks have shifted somewhat in the decades since Medicare was introduced.

In several areas, we know more now about what is changing, and what is not, than in the past. This year's report showcases a variety of new and updated information and research. For example, we now know how patients fare 30 days after being initially admitted to hospital for a heart attack or stroke in regions across the country. We also know how likely it is that patients with different types of conditions will be readmitted to hospital for further care. Findings from the Canadian Community Health Survey also offer new insights into how health and the use of health services vary from coast to coast.

We have come a long way, but there is still a long journey ahead. Many questions remain unanswered. And the world of health care continues to evolve, even in the two years since we published the first *Health Care in Canada* report. A fuller understanding depends on a broad range of timely, reliable, systematic, and comparable data and analysis that will fill important information gaps.

In future reports, we hope to continue to build on the base of knowledge that exists today. We will also watch how Canada's health care system, the people who work in it, and those who use it respond to the recent health care reviews and other winds of change.

Listening for Direction

In early 2001, CIHI and four other organizations conducted a broad cross-Canada consultation on priority health services and policy issues.[2] Policy-makers, managers, and clinical organizations identified key areas where they had questions that research could address over the next two to five years. Eight primary themes came up often, in a variety of forms, across many settings and perspectives. They were:

- Health human resources
- Financing and public expectations
- Governance and accountability
- Driving and managing system change
- Improving quality
- Health care evaluation and technology assessment
- Public advice-seeking in the era of e-health
- Improved access for 'marginalized' groups

In addition, the consultation process identified seven secondary themes:

- Primary health care
- Globalization
- Regionalization
- Population health
- Continuum of care and delivery models
- Performance indicators, benchmarks, and outcomes
- Evolving role of informal and voluntary care

This report touches on a number of these themes. We hope to be able to explore several in more depth in the future, as the state of information, analysis, and research evolves.

Already, we are planning for 2003. We welcome feedback from everyone—the public, health professionals, and others—to help us to continue to improve our ability to meet your information needs. Please contact us by filling out the feedback form at the end of this report or by emailing us at healthreports@cihi.ca.

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