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Health Care in Canada



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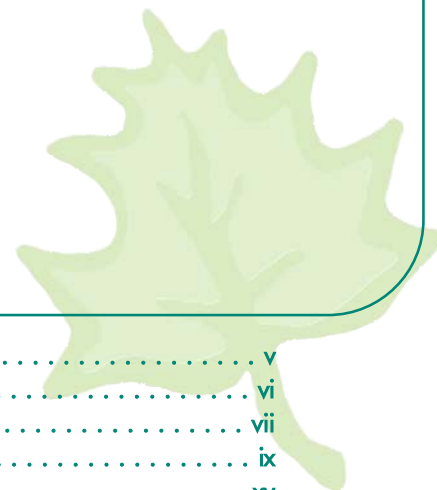


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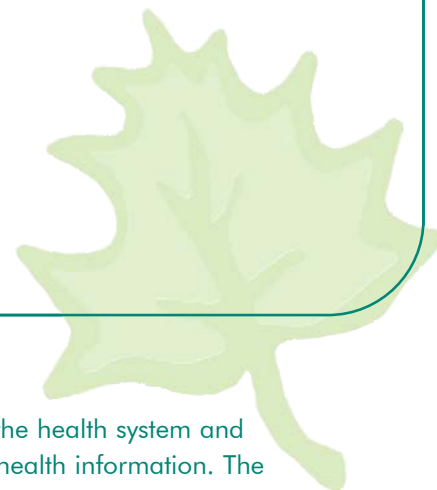
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About the Canadian Institute for Health Information



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.

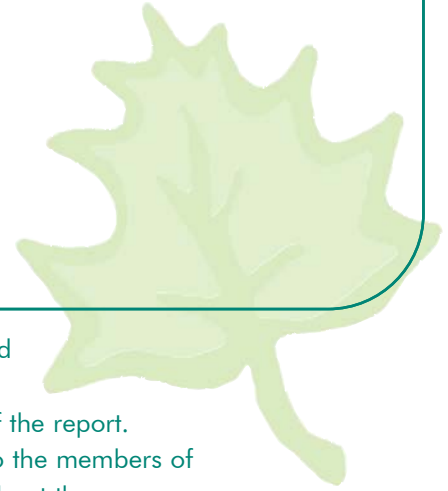
As of April 1, 2004, the following individuals were members of CIHI's Board of Directors:

- **Mr. Graham W. S. Scott**, Q.C. (Chair), Managing Partner, McMillan Binch LLP
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About Statistics Canada

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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Particularly, we would like to express our appreciation to the members of the Expert Group, who provided invaluable advice throughout the process. Members included:

- **Mr. Steven Lewis** (Chair), President, Access Consulting Ltd., Saskatoon
- **Dr. Victor Dirnfeld**, Past President, Canadian Medical Association and Chair, Medical Advisory Council of the Vancouver Coastal Health Authority
- **Mr. Dan Florizone**, Assistant Deputy Minister, Saskatchewan Ministry of Health
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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 2004 report included Jennifer Zelmer, Kira Leeb, Cheryl Gula, Patricia Finlay and Jack Bingham. Health Reports staff who contributed to the report were Lynne Duncan, Luisa Frescura, Sharon Gushue, Thi Ho, Luciano Ieraci, Jeanie Lacroix, Tina LeMay, Geneviève Martin, Jennifer Phillips, Karin Schoeberle, and Anne Tenenbaum.

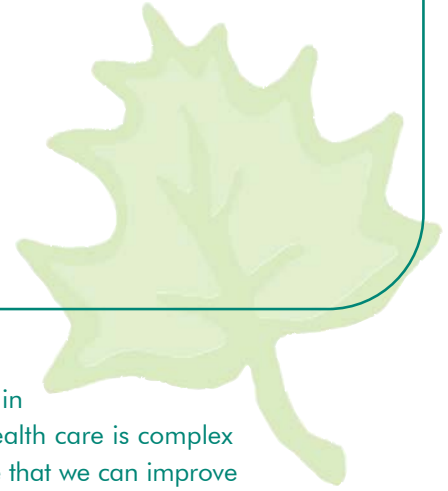
Health Indicators 2004 was developed by Zeerak Chaudhary, Ruth Diaz, Jason Lan, Kathy Nguyen, Joan Porter, Indra Pulcins, Carolyn Sandoval, Greg Webster, Eugene Wen, and Shamali Wickremaarachi.

Production of this report involves many people and many aspects of the CIHI organization. We want to thank all CIHI staff for their contribution to this report, including individuals from Publications, Translation, Communications, Health Expenditures, Health Human Resources, Distribution Services, and the Web.

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Report Highlights



Part A: Focus on Safe Care

Patient safety and medical errors are hot topics—not only in Canada, but also in many countries around the world. Health care is complex and inherently involves risks; but there is growing evidence that we can improve patient safety. In fact, significant progress has already been made in some areas. By studying errors, improving procedures and system design, introducing standards of practice, and enhancing equipment training programs, for example, anaesthesiologists have transformed their safety record over the past 30 years.

The first part of *Health Care in Canada 2004* is devoted to safe care. It aims to help us better understand what we know and don't know about this important area.

What We Know

- In Canada, researchers found that in 2000–2001 adverse events occurred in 7.5% of medical/surgical admissions in non-specialized acute care hospitals. The two most common types of events identified were those related to surgical procedures (34% of total) and drug- or fluid-related events (24%).* Expert reviewers considered 37% of adverse events to be “highly preventable.” Most patients recovered from adverse events within six months, but about 21% (or between 9,250 and 23,750 people across the country) died, possibly as a result of the event.
- Reviews of hospital charts from different countries, although not strictly comparable, do reveal both similar and dissimilar rates of in-hospital adverse events, depending on what is being measured. Based on chart reviews, researchers in the United States (U.S.), Australia, England, and elsewhere all estimated that the rate of serious adverse events (resulting in mortality or major disability) occurring in hospitals is less than 2%. However, there are large gaps in international estimates of *total* adverse event rates (minor and major).

* Expert reviewers could attribute events to more than one service.

- Around the world, there is broad consensus in the patient safety community that encouraging more open reporting is one step to creating a culture of safety. Experts agree that under-reported adverse events represent lost learning opportunities. More than 70% of health professionals surveyed in 2003 said that under-reporting of adverse drug reactions was a very or somewhat serious problem in Canada today. Many other types of events are also typically under-reported in Canada and elsewhere.
- In an international survey, almost a quarter of respondents from Australia, Canada, New Zealand, and the U.S. who had health problems claimed they had experienced either a medical or medication error in the past two years. In the United Kingdom (UK), rates were closer to 18%. Over half (51 to 63%) of those reporting a medical error also reported that it had caused serious health problems. Most hospital executives in these countries have agreed on certain strategies that would reduce error and improve the quality of care. Some countries are also pursuing other patient-safety related initiatives, including legislation.
- In 2003, 5.2 million Canadians (about 24%) reported that they or a family member had ever experienced a preventable adverse event related to their care. Of those who had experienced an event, about half (52%) said that the most recent event had had serious consequences.
- Canadians are less likely to sue for medical malpractice than Americans, but 76% believe that the threat of litigation may help ensure quality care. At the same time, 67% felt that it could result in physician shortages. The Canadian Medical Protective Association (CMPA) reported a seven-fold increase in the rate of malpractice claims between 1971 and 1987 (average growth rate of 6.4% per year). Since then, rates have stabilized, ranging from 1.7 to 2.5 claims per 100 physicians annually.
- New patient safety indicators are being developed to help flag potential adverse events. For example, CIHI data suggest that from 2000–2001 to 2002–2003 there were 0.15 foreign objects (e.g. a sponge or an instrument) left in patients after a procedure per 1,000 surgical and medical discharges. Other types of events, such as those related to medications, are more common.
- In a 2002 international survey asking “sicker” adults in five countries about their experiences with medication errors, 11% of Canadian respondents said that a doctor, hospital, or pharmacy had given them the wrong medication or dose in the past two years. The more doctors a patient saw, and the more prescriptions a patient had, the more likely the patient was to report having experienced drug errors or medical mistakes.

- In the U.S., an estimated 2 million cases of nosocomial (health-care associated) infections are reported annually, contributing to about 90,000 deaths. It has also been estimated that at least 20% of nosocomial infections contracted around the world are preventable. Preliminary Canadian estimates are that 110 nosocomial infections occur per 1,000 adult patients in hospital (89 per 1,000 child patients), and that patients in intensive care wards are more likely to contract an infection than surgical or medical patients.
- In a 2000 study, 87% of hospitals reported following less than 80% of surveillance recommendations, and 90% were putting less than 80% of infection-control recommendations into practice.

What We Don't Know

- How many Canadians experience adverse events or near misses each year? How does the rate of occurrence vary across the country? What is the annual human and economic toll?
- How do adverse event rates in hospitals compare across countries and over time? How do these rates affect population health, health care expenditures, and patients, families, and health care providers?
- How often do adverse events occur outside of hospital? What are the most effective ways of capturing the extent and impact of serious and minor events, as well as near misses?
- What policies, strategies, and practices are most effective in improving patient safety? What are their relative costs and benefits? To what extent are they being employed in Canada? How can countries best work together to improve patient safety across the health care continuum?

Part B: Our Health Care System: Resources and the Patient Experience

Chapter 6: Providing and Experiencing Care

What We Know

- Most Canadians continue to visit a family doctor at least once a year. Use of other services varies significantly across the country and has changed over time. For example, Canadians are more likely than in the past to visit a complementary/alternative health care provider (11% of Canadians 12 years and older did so in 2000–2001, up from 5% in 1994–1995). New technologies are also changing care in other ways. For example, Canadians in most parts of the country can now call registered nurses to ask about their health problems. The nurses use on-line decision support systems to help decide what advice to give to each caller.
- In Canada and around the world, dozens of studies have found links between income and health. Use of health services also varies by income. In Canada in 2000–2001, Canadian teens and adults with low incomes were more likely to have stayed overnight in hospital in the past year, were about as likely to have visited a physician at least once, and were less likely to have visited a dentist (dental care is typically not covered by provincial health insurance plans).
- Between 1997 and 2000, about 49% of health care professionals retired before the age of 65. On average, RNs retire in their mid-50s, and projections show that Canada could lose more than 64,000 RNs aged 50 or older by 2006 if they decide to retire (or if they die) by age 55. This number represents 28% of the total RN workforce in 2001. If RNs were to continue working until age 65, about 13% of the 2001 workforce would have retired by 2006.
- Scopes of practice are changing for many health care professions. For example, family doctors billing provincial fee-for-service insurance plans were more likely to provide mental health services in 1999 than in 1989, but less likely to undertake other types of care, such as caring for patients in hospitals and surgery. Changing scopes of practice have also become critical considerations for educational programs. This may be due in part to the growing complexity of health care, increasing educational and entry-to-practice requirements, changing roles of those working in inter-disciplinary teams, and the increased acuity of patients seeking care. Teamwork is also being emphasized.
- Men are up to five times more likely than women to be hospitalized for a heart attack (depending on the age group) and have double the rate of mortality for ischemic heart disease, which includes heart attacks. As well, CIHI data show that, although more men than women were admitted to hospital with new heart attacks, women who were hospitalized were more likely to die within 30 days (12.5% versus 11.3%).

What We Don't Know

- How will changes in enrolments, entry-to-practice requirements, education programs, provider demographics and working conditions, and other factors affect the number and mix of health professionals?
- What explains the regional differences in utilization of health services, mortality, readmissions, survival, and other outcomes of care?
- How do wait times for different types of care vary across the country? How often do Canadians receive care within recommended periods of time? What effect does waiting have on patient outcomes, the cost of care, and public confidence in the health system?

Chapter 7: The Cost of Health Care

What We Know

- In 2003, Canada is forecast to have spent \$121.4 billion on health care. This amounts to 10% of the total economy (gross domestic product), a historic high first reached in 1992.
- Average per capita spending on health care for 2003 was forecast at \$3,839, an increase, after inflation, of 30% since 1993 and 62% since 1983. The per capita spending rate, which varied across provinces and territories, was highest in the sparsely populated Yukon Territory (\$4,648) and Northwest Territories (\$6,800). In 2001, Canada's per capita spending on health care ranked fifth in the OECD (Organisation for Economic Co-operation and Development), behind the U.S., Switzerland, Norway, and Germany.
- In 2003, seven of every 10 dollars spent on health care came from the public purse. Governments and social security programs spent almost \$85 billion on health care, up about 40% (after inflation) from 1993. The percentage of public funding varied across the country from a high of 95% in Nunavut to a low of 66% in Ontario. Internationally, Canada's public share was 71% in 2001, compared to 44% in the U.S. and about 85% in the Scandinavian countries.
- Both private and public spending on prescribed drugs has increased in recent years. Prescribed drugs comprised 13% of total health expenditures in 2003 (forecast), an increase from 1993. A further 3% was spent on nonprescribed drugs. The total amount spent on prescribed drugs rose 142% between 1993 and 2003 (in current dollars). For the public sector, retail drug sales accounted for 9% of total expenditures, up from 6% in 1993. For the private sector, retail drug sales accounted for 23% of total spending, up from 18% in 1993.

What We Don't Know

- What investments, either within the health sector or outside of it, would produce the largest overall health gains?
- How do changes in health care spending affect the health of Canadians?
- How do differences in private and public funding and service delivery affect costs, access, quality, and health outcomes of Canadians?
- To what extent do different factors (e.g. geography, population, health status and wage differences) explain variation in health spending between jurisdictions?

About This Report



Since the publication of the first of an annual series in 2000, the aim of each *Health Care in Canada* report, produced by Canadian Institute for Health Information (CIHI) with help from Statistics Canada, has been to shed light on specific issues while providing updated data and analyses of topics of continuing importance. Each year, CIHI researchers gather the most recent data available about the Canadian health system and, where possible, compare these internationally. Every report also includes data on various health indicators.

To ensure continuity, new reports build on those that went before while highlighting the latest local, regional, provincial/territorial, national, and international research. Finally, they also reflect feedback received from health professionals, researchers, policymakers, media, and individual Canadians, whose contributions help us identify new topics.

CIHI hopes that with each consecutive *Health Care in Canada* report, our knowledge of the health care system increases. At the same time, the more we learn, the better we are able to identify gaps in information. We emphasize this important function of the reports by highlighting examples of what we know and what we don't know at the end of each chapter. One result of this popular feature has been to facilitate collaboration between CIHI and its partners in filling those gaps.

This year's report is divided into two sections:

Part A: *Focus on Safe Care* This first part of the report includes information on what safe care is, as well as what we know and don't know about patient safety in Canada and worldwide.

Part B: *Our Health Care System: Resources and the Patient Experience* This includes information on health human resources, experiencing care, wait times, and the cost of providing health care in Canada.

The report also includes a companion document: *Health Indicators 2004*. This convenient reference offers comparative data on a range of health and health system indicators for health regions with populations of 75,000 or more—comprising more than 90% of Canada's total population—and for provinces and territories. Wherever the icon to the left appears beside the text, it indicates that related regional or provincial/territorial data can be found in the insert.



For More Information

Highlights and the full text of *Health Care in Canada 2004* are available free of charge in both official languages on the CIHI Web site at www.cihi.ca. To order additional printed copies of the report (a nominal charge will apply to cover printing, shipping, and handling costs), please contact:

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The companion document, *How Healthy Are Canadians, 2004?* will also be available through the Web after its release.

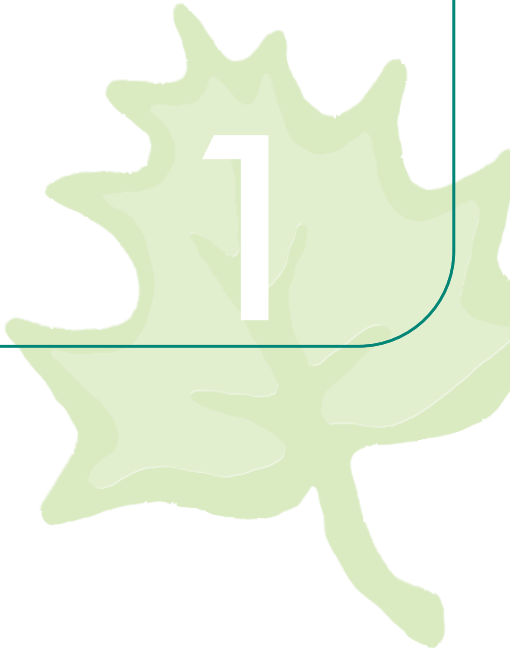
We welcome comments on *Health Care in Canada 2004* and suggestions about how to make future reports more useful and informative. For your convenience, a feedback sheet ("It's Your Turn") is provided at the end of this report. You can also e-mail your comments to healthreports@cihi.ca.

There's 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). On the day that *Health Care in Canada 2004* is released, and in the weeks and months following, we will be adding much more information to what is already available electronically. For example, it will be possible to:

- Download free copies of the report and the Indicators in English or French.
- Read highlights of the report in our easy-to-read brochure.
- Sign up to receive regular updates to the report via e-mail.
- View a presentation of the report's highlights.
- Look at previous annual reports; related reports, such as *Improving the Health of Canadians*, *Medical Imaging in Canada*, and *Canada's Health Care Providers*; CIHI's regular series of reports on aspects of health spending, health human resources, health services, and population health; and reports from Statistics Canada.
- Learn about upcoming reports, including a series of reports on *Giving Birth in Canada*.

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



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



Once again, health care stories filled the headlines in 2003. Some focused on longstanding challenges, such as resources, waiting times, and reform. Others highlighted emerging initiatives and issues—SARS, the creation of the Health Council of Canada, and Internet pharmacies, to name a few.

When we wrote last year's report, we were in the eye of the hurricane between what became known as SARS 1 and 2. Then and later, "new" viruses and the challenges of integrated systems dominated the health news. The year 2003 reminded us that power grids cross borders, as do bacteria and viruses. Many of the challenges were global in origin, confirming that the planet is interconnected and that effective responses may require international cooperation.

The common thread running through these events—and through stories about local issues, such as emergency room crowding—is the need for integrated, not isolated, solutions. For example, efforts to prevent flu and other diseases, the system's capacity to care for patients when they leave hospital, and much more, may affect emergency department use.

Experts suggest that improving patient safety also requires broad-based action. Interest in this area gathered steam over the last year, fuelled, in part, by new research on the extent of the problem in hospitals and elsewhere.

High-profile incidents also captured public attention as new policies in several parts of the country encouraged proactive disclosure of patient safety issues. For example, several Ontario hospitals identified failures to follow instrument sterilization practices in November. They took proactive steps to notify and offer testing to all patients who might have been exposed to a health risk. In January, Hôpital Ste-Justine in Montréal revealed that an HIV-positive surgeon operated on 2,600 children over a 13-year period. HIV specialists unanimously agreed that the risk was extremely low, but the hospital nevertheless launched a follow-up and testing program. Two months later, Calgary's health region announced that a problem with a dialysis solution had contributed to two deaths. Quick investigation by an ICU physician identified the problem and allowed the region to take steps to prevent further harm.

The good news is that patient safety is now a priority; preventable adverse events are out in the open. Edmonton will be home to the new Patient Safety Institute designed to "promote innovative solutions and to facilitate collaboration among governments and stakeholders to enhance patient safety."⁴ Building on recent patient safety work and initiatives, we take an in-depth look at safe care in this year's report. Four chapters in *Part A: Focus on Safe Care* cover different aspects of this issue.

A Few of the Hot Stories in 2003–2004

- The SARS outbreak may have passed, but the learning continues. The report of the Advisory Committee on SARS and Public Health, *Learning from SARS: Renewal of Public Health in Canada*, lauded the actions and dedication of many health care providers. However, it also raised concerns about Canada's preparedness for SARS-like outbreaks and called for a major upgrade to the public health system.¹ The federal government promised swift action. An independent commission initiated by the Ontario government is also underway.
- West Nile virus hit hardest on the Prairies, with nearly 1,100 of just over 1,200 confirmed or probable cases in Saskatchewan and Alberta.²
- Emergency rooms filled up in many parts of the country last winter, leading Manitoba's health minister to refer the issue to the new Health Council of Canada.
- A new national study showed that thousands of patients in Canadian hospitals need longer stays, are disabled, or die each year because of unintended injuries and complications related to their health care.³ As in other countries, some situations are preventable, others not. The overall toll is high.

Weighing the Risks

Health care involves risk. Every day, health care providers help patients and families to weigh potential benefits and risks of health interventions. At a broader level, one of the health system's challenges is how to anticipate and manage risk, how much to invest in reducing it, and how to set priorities.

An interesting paradox is that the level of public concern doesn't always match the probability of risk. According to the experts, the risk of harm from the imperfectly sterilized hospital instruments and HIV-infected surgeons using standard practice guidelines is extremely low (with no reported illness to date). However, novel events such as these make the news and can raise public fears, and may lead to hastily developed plans to address relatively modest risks. Conversely, preventable adverse events are estimated to directly or indirectly cause morbidity and/or mortality for several thousand Canadians each year in hospitals and in the community. Yet, until recently, they have received relatively little public attention.

Research⁵ suggests that a number of factors affect how we assess risk, including:

Dread: We are much more likely to die from heart disease than a shark attack; but "dreadful deaths" often evoke strong fears.

Control: When we feel that we have more control over a situation, we tend to believe that the risk is lower.

Nature of the Risk: Natural risks (for example, skin cancer from radiation from the sun) often get less attention than those arising from human-made technology.

Choice: A risk that's imposed on us often looms larger than one that results from a choice that we make.

Children: Risks to kids often scare us more than those experienced by adults.

Newness: New risks often seem worse than those that have been around for years.

Awareness: The more aware we are of a risk, perhaps because of media coverage, the more concerned we are apt to be. That's true even when other (often more probable) risks haven't gone away.

Personal Impact: Could you, or someone that you know, be a victim? If you think so, you're likely to give more weight to the risk in question.

The Risk/Benefit Trade-off: Often in health care, there are potential risks and benefits to a course of action. Threats in these cases are likely to seem smaller than in situations where there's no perceived gain.

Trust: The more we trust those who protect us, those exposing us to a risk, or those telling us about it, the less concerned we are likely to be.

Policy Initiatives

After a year of negotiation, the Health Council of Canada became a reality in December 2003. With 26 government and expert/public representatives, the Council's mandate is to monitor the First Ministers' Accord on Health Care Renewal of February 2003. Alberta and Quebec have decided not to participate directly, although Quebec has promised to collaborate through its Conseil de la santé et du bien-être.

The Health Council of Canada is not the only new kid on the block. In early 2004, Alberta expanded the role of the Health Services Utilization and Outcomes Commission to include quality and patient safety. It was renamed the Health Quality Council of Alberta, joining councils established by Saskatchewan and Cancer Care Ontario in 2003. Ontario has announced plans to follow suit. These councils generally aim to monitor the quality and effectiveness of health care and to take public reporting to a new level.

Primary health care, an area highlighted by First Ministers in 2003, remained a priority for policy-makers. The federal government's \$800 million Primary Health Care Transition Fund is supporting numerous large-scale initiatives across the country. Many provinces and territories are adding to this investment.

Most governments are pursuing strategies to shift to more interdisciplinary care. Their goal is typically to offer comprehensive and convenient care that will particularly benefit patients with complex and chronic health problems. For example, Canadians

Hoping for the Best, Planning for the Worst

In February 2004, Health Canada announced the Canadian Pandemic Influenza Plan.⁶ Designed with the provinces and territories, the plan describes how to deal with a massive outbreak of a deadly strain of flu. It contains strategies for vaccinating the population (who and in what order of priority, should vaccines be in short supply); plans to control the outbreak in the workplace; clinical care guidelines and tools; laboratory procedures; and a host of other measures.

in almost all parts of the country can now get advice from nurses staffing 24/7 phone lines, an option unheard of just a few years ago. There are numerous efforts to bring physicians, nurse practitioners, and other front-line health professionals together to deliver team care. Some provinces are also introducing new funding streams. Alberta physicians, for instance, can get \$50 per year for each patient in their practice if they ensure 24/7 care and access to a wide range of services for their patients.

Drugs are also high on the policy agenda, both in Canada and abroad. In 2003, Canadian governments agreed on the Common Drug Review, streamlining the process of assessing the therapeutic value and cost-effectiveness of new drugs. This collaboration aims to reduce duplication and creates an opportunity for greater consistency in formulary policies and practices across the country.

More on HRT

The last year brought yet more developments in the hormone replacement therapy (HRT) saga. A once-staple treatment appears, at least for now, to be on the decline; the head of Germany's Commission on the Safety of Medicines went so far as to compare it to thalidomide.⁷ In January 2004, the Canadian Cancer Society weighed in to the debate. Its new guidelines advised women not to take combined estrogen and progestin therapy unless their menopausal symptoms were severe and unresponsive to other forms of treatment.⁸

By then, HRT use had already declined steeply in response to highly publicized studies that suggested women on HRT were at increased risk for breast cancer, heart disease, stroke, and blood clots in the lung—more than offsetting the treatment's positive impact on colorectal cancer rates and hip fractures.^{9, 10, 11} A U.S. study found that prescriptions for HRT have decreased by almost 40% between July 2002 and July 2003.¹² Statistics Canada reported that 1.2 million women took HRT in 2001, and polls¹³ suggest that this number may be dropping.

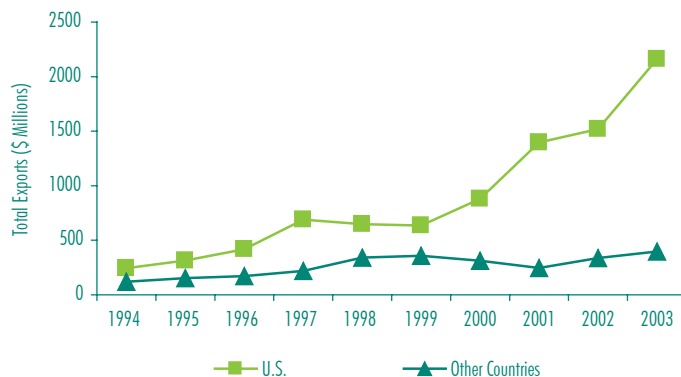
Policy-makers were also talking across international borders. Internet drug marketing became big business, with Canadian companies shipping prescriptions at cheaper than full retail prices into the massive American market. As of May 2003, there were an estimated 100 Internet pharmacies operating in Canada, filling as many as 2,000 individual orders daily.¹⁴ Some, but not all, of these drugs were re-sold to the U.S. after being manufactured there originally under supervision of the U.S. Food and Drug Administration (FDA).

The practice set off a cascade of events and responses. U.S. city and state governments, such as those in Boston, Illinois, and New Hampshire, contracted with Canadian suppliers to cut the costs of benefit programs for employees and retirees. Opponents, notably pharmaceutical companies and the FDA, quickly decried the practice, which raised concerns about the safety of products coming in from Canada and other countries.¹⁵

It wasn't just Americans who raised concerns. The Canadian Pharmacists' Association released *The CPhA Statement on International Prescription Services and Distance Provision of Pharmaceuticals*.¹⁶ The statement stressed the importance of the face-to-face relationship between pharmacists and patients in ensuring that patients use medications safely and effectively. Similarly, the Canadian Medical Association and some provincial Colleges of Physicians and Surgeons consider co-signing

Booming Exports

Exports to the U.S. of medications in measured doses or packed for retail use grew much faster between 1994 and 2003 than those to other countries. Export figures shown below are in Canadian dollars, not adjusted for inflation (category HS3004).



[View Data](#)

Source: Trade Data Online, Industry Canada, based on data from Statistics Canada and the U.S. Census Bureau.

of prescriptions by a physician who has not examined a patient and has no knowledge of his/her medical history to be professional misconduct.¹⁷ The Canadian Medical Protective Association announced it would not provide legal assistance to physicians who co-sign prescriptions without seeing or knowing the patients.¹⁸

Changes in Health Care

New reports highlighted changes in high- and low-tech health care. For example, CIHI's *Medical Imaging in Canada* report focused on the availability and distribution of major diagnostic equipment.¹⁹ The past decade has seen rapid growth in machines and scans. In 2001, Statistics Canada found that 6.7% of adults had received a non-emergency MRI, CT, or angiography in the past year. By late 2003, rates had risen to about 11%, according to a new smaller survey.

The number of machines is also up, but we have fewer MRI and CT scanners per capita than many OECD countries. Countries with more machines, however, do not necessarily provide more scans. For example, Manitoba had about half the number of MRI scanners per capita as England in 2001. Yet the province reported a higher scan rate that year.

Significantly, we know little about the health impact of having more or fewer machines. Used optimally, imaging technologies can pinpoint problems, rule out diagnoses, and pre-empt some surgeries. Used excessively, they may lead to unnecessary and sometimes risky invasive diagnostics and procedures. Or they may soak up dollars that could be used elsewhere to achieve larger health gains.

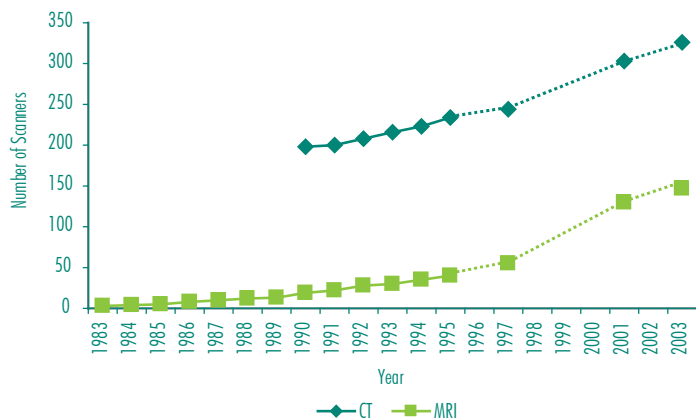
In February 2003, First Ministers called for a new strategy to assess the impact of health technologies, their costs and benefits, and how to ensure that they are used effectively. The 2003 federal budget allocated

\$45 million dollars over five years to the Canadian Coordinating Office for Health Technology Assessment. Specific studies are also underway. For example, a \$4.5 million study is evaluating the cost and benefits of PET (positron emission tomography) scans in the detection and treatment of cancer.²⁰ It is expected that the results will help provincial governments decide whether or not they will fund the scans out of the public purse.

Of course, evaluation is important for more than just high-tech equipment. In February 2004, the Institute for Clinical Evaluative Sciences (ICES) published a comprehensive report on the quality of cardiac care in Ontario.²¹ The report highlights variations in quality, not just wait times or intervention rates. Overall, the research team found that the quality of care was good. (However, 80% of heart attack patients had at least one modifiable

Canada's Supply of MRIs and CTs Is Growing 2

Numbers of magnetic resonance imaging (MRI) and computed tomography (CT) scanners in Canada between 1983 and 2003, including units in hospitals and in free-standing imaging facilities.



Notes: 1) The numbers of MRI and CT scanners in free-standing imaging facilities were imputed for years prior to 2003 based on data collected in the 2003 National Survey of Selected Medical Imaging Equipment. 2) Canadian Coordinating Office for Health Technology Assessment (CCOHTA) inventories were not conducted annually. A dotted line is drawn between data points spanning two years or more.

[View Data](#)

Sources: OECD Health Data 2002, OECD (1983–1990); National Inventory of Selected Imaging Equipment, CCOHTA (1991–2001); National Survey of Selected Medical Imaging Equipment, CIHI (2003)

risk factor, such as smoking, hypertension, high lipid levels, diabetes). The chart-based study also estimated that 178 to 250 lives could be saved each year in Ontario by improving services provided after heart attacks.

Interprovincially, specialized paediatric cardiology services in the Prairies are now consolidated in the Capital Health Region in Edmonton. The goal is to ensure that there are enough cases to allow surgeons and support teams to develop and maintain their skills and provide high-quality care. Other services are also being concentrated in a single location. For example, the Winnipeg Regional Health Authority acquired Canada's first gamma knife, a \$7 million instrument that treats brain abnormalities such as cancerous tumours with low doses of radiation instead of surgery.²² It is designed to lower the risk of infection and hasten recovery times using a procedure that is more precise and that does less damage to surrounding tissue.

In contrast, care for common conditions takes place across the country. In September 2003, Statistics Canada released the largest-ever survey on mental health and well-being. The survey covered alcohol and illicit drug dependence and five mental disorders: major depression, mania disorder, panic disorder, social phobia, and agoraphobia (fear of anxiety-producing situations). One in 10 Canadians aged 15 years and over reported symptoms consistent with one of these conditions in the year prior to the interview. That's about 2.6 million people. The most common condition was major depression. About as many Canadians suffer from major depression (4%) as from other chronic conditions such as heart disease (5%), diabetes (5%), and thyroid conditions (6%). Data also showed that while those aged 15 to 24 were more likely to report having one of the mental disorders, they were less likely to use mental health services than Canadians of other ages.²³

Resources

Health care spending continued its upward spiral, reaching an estimated \$121 billion in 2003. That's close to \$4,000 per person. Private spending accounted for 30% of the total, matching its all-time high since medicare was introduced. (See Chapter 7 for details.)

To put this into historical perspective, per capita spending reached \$1,000 in 1981, \$2,000 in 1989, and \$3,000 in 1999. In constant as well as current dollars, the pace has picked up considerably. After taking inflation and population growth into account, spending is double what it was 25 years ago. Hospitals remain the largest area of expenditure. They represent 30% of the total, down from about 45% two decades ago. Retail drug sales are moving in the other direction. They accounted for 16% of total spending in 2003 (13% for prescription drugs and 3% for non-prescription drugs), double the percentage of the late 1970s.

Overall spending was up, and the need for sustainability was discussed across the country. In this context, the federal government and the provinces continued to negotiate over money. Prime Minister Martin agreed to provide \$2 billion extra in one-time funding for 2003–2004. Some provinces and territories called for more. There are also signs that some plan to tighten the health care belt. In February 2004, for example, British Columbia announced a two-year freeze in health sector wages and annual total spending increases of about 3% through 2006–2007.²⁴ Time will tell how these and other choices will affect tomorrow's spending levels.

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Focus on Safe Care

Potassium chloride (KCl) can save lives—or it can take them. Early 2004 brought a tragic reminder of this fact when two patients in an intensive care unit in Calgary died. When high levels of potassium were discovered in the second patient's blood, a doctor had their dialysis fluid tested. The results showed that it contained potassium chloride, not sodium chloride. Further investigation showed that the mix-up took place when the solution was prepared in the hospital pharmacy.

What happened? The Health Region was quick to assure the public that the substitution was not deliberate. Health professionals strive to provide safe care for their patients, and bad outcomes can be devastating for all those involved. Experts in patient safety suggest focusing not on “naming, blaming, and shaming” individuals, but rather on determining the root causes of what happened and how to prevent future problems. For example, the Foothills Medical Centre bought potassium and sodium chloride from the same manufacturer, and solutions were in similar packaging. And, in this particular pharmacy, they were stored directly across the aisle from each other, making it relatively easy to use the wrong one.

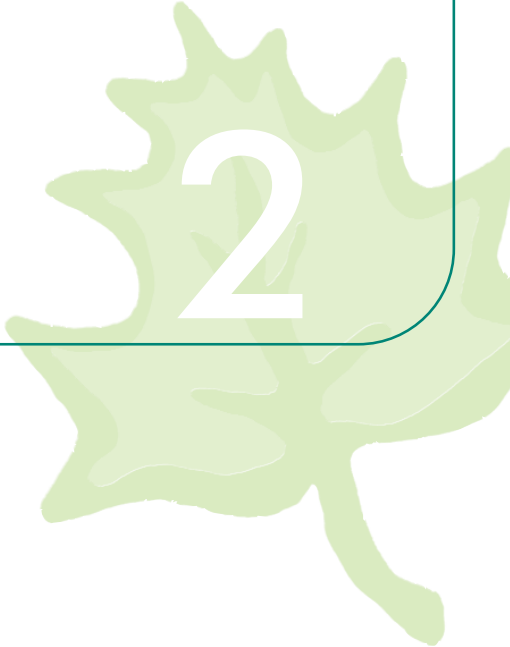
While most patients have good experiences, the situation in Calgary was not an isolated event. Concerns about patient safety are neither unique to Canada, nor new. Decades ago, for instance, Florence Nightingale showed that injured soldiers were seven times more likely to die from disease in hospital than on the battlefield. Today, medication errors are one of the most common types of adverse events. KCl, in particular, has been linked with a number of accidental deaths, both in Canada and elsewhere.

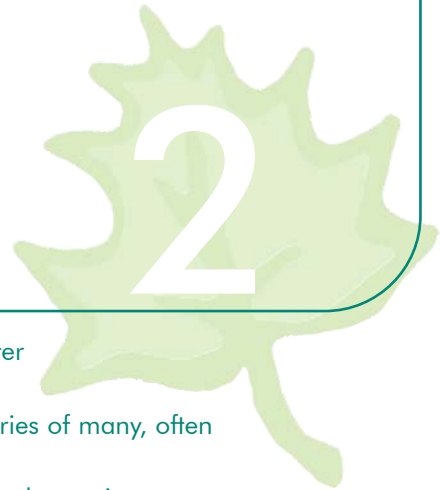
But the story is not all bleak. Successes in tracking, understanding, and reducing the likelihood of adverse events abound. For example, anaesthesia is now much safer than it used to be. In the not-too-distant past, those undergoing anaesthesia had a case-fatality rate of one in 3,000 to 4,000 (1950s). Today, it is one in 200,000 to 300,000, or five deaths per million cases (U.S. data).¹ Many hospitals, including Calgary's, have removed concentrated KCl from patient wards. The Calgary hospital has also changed where it stores the solution in the pharmacy and plans to order it and sodium chloride from suppliers who use different packaging.

Part A of this report provides a snapshot of what we know and don't know about patient safety. Chapters 2 to 5 look at the extent and types of adverse events in Canada and elsewhere, as well as strategies to improve patient safety.

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Making Health Care Safer





Making Health Care Safer

The events on Three Mile Island and the Challenger disaster occurred years and miles apart, but they shared common threads. In both cases, investigations determined that a series of many, often ill-defined, events led to tragedy.

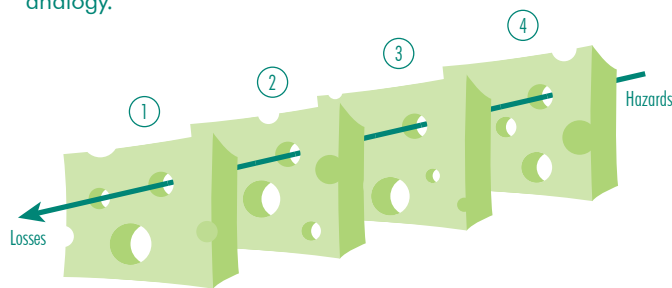
Like nuclear energy and aerospace, health care is a complex environment where errors can maim or kill. Added to this are the other financial and non-financial consequences, leading the World Health Organization to identify adverse events as “a challenge to quality of care, a significant avoidable cause of human suffering, and a high toll in financial loss and opportunity cost to health services.”¹

James Reason, an international expert in the field, sees patient safety as a constant battle between the complexity of health care and the defences and barriers that guard against error.² Engineered or physical barriers (e.g. alarms), well-trained health professionals, and standardized procedures and protocols are examples of layered defences that safeguard patients. Ideally, each layer would be impermeable, and no errors would pass through. In reality, however, like Swiss cheese, they have holes. When multiple systems failures or gaps (the holes in the cheese) line up, mistakes that would usually be caught go unnoticed. When this happens, the multi-layered defence fails and an error occurs.

The Swiss Cheese Analogy

3

James Reason’s analogy illustrates how layers of defences, barriers, and safeguards, each of which has holes, can be used to describe the trajectory of adverse events. The picture below shows a few examples of the types of strategies that can be used to prevent medication errors, using a “Swiss cheese” analogy.



1
Thanks to supportive culture fostered by the health care team, the patient feels confident to check with the nurse that the medication is in fact theirs, not that of the patient in the next bed

2
A poster regarding look-alike, sound-alike drugs alerts nurses to verify drugs before administration

3
Storage of drugs in the pharmacy and packaging of medications is designed to reduce mix-ups during dispensing

4
A physician orders the medication using an automated system that flags potential drug interactions

Gaps in defences can exist at many levels. Some are active failures* that occur at the point of contact between a patient and a health professional. Examples include giving a patient the wrong medication or making a procedural mistake. Others are latent conditions and are system-related. Examples include labelling and storage of drugs, or how much time is allocated to exchange information at shift change. They typically arise from decisions made by groups such as product designers, policy and protocol developers, and management. James Reason argues that “such decisions may be mistaken, but they need not be.”² Nevertheless, they can translate into a climate that permits certain types of errors to occur or can create persistent weaknesses in defences against adverse events.

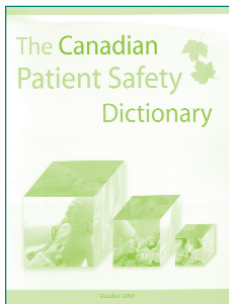
Source: Adapted from J. Reason, “Human Error: Models and Management,” *British Medical Journal* 320 (2000): pp. 768–770.

* The National Steering Committee on Patient Safety defines an *active failure* as “an event/action/process that is undertaken, or takes place, during the provision of direct patient care and fails to achieve its expected aims. While active failures may contribute to patient injury, not all do.”³

This chapter focuses on actions that are being taken at broad system levels to create a culture and climate that promote patient safety. Chapter 5 profiles actions being taken to address specific issues, such as medication errors and falls in health care facilities.

Untangling the Terms*

Patient safety is about doing the right things right and preventing and mitigating unsafe acts within the health care system. It is an integral component of a comprehensive quality assurance program. In implementing patient safety initiatives, a bewildering array of terms is often used. To sort through the confusion, a working group of the National Steering Committee on Patient Safety, in conjunction



with the Royal College of Physicians and Surgeons of Canada, produced *The Canadian Patient Safety Dictionary*.³

Consistent with this approach, the term **adverse events** is used to describe bad outcomes from care. Officially, they are “undesired and unplanned occurrences, directly associated with the care or services provided to a patient/client in the health care system.” They can be preventable or non-preventable, given our current knowledge base. For example, some patients react poorly to a medication or suffer complications from surgery

even though no error was made during their care. This is non-preventable. **Medical error** is the term used to represent “the failure to complete a planned action as it was intended or when an incorrect plan is used in an attempt to achieve a given aim.” A patient who dies after being given a medication to which they have a known allergy would be an example. A **near miss** occurs when a potential error is caught before a bad outcome occurs.⁴

Thinking Differently About Patient Safety

By law, new cars must have alarms to remind you to fasten your seatbelt. Bank machines force customers to take their card before they can retrieve their cash, reducing the number of cards left behind. Nuclear power plants have interlocking layers of technical, human, procedural, and other safeguards designed to prevent accidents.

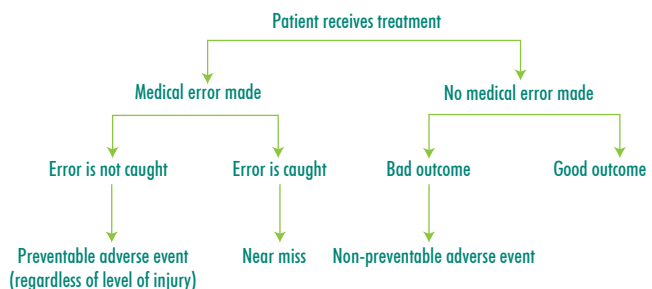
From simple tasks to complex environments, many different industries use knowledge from decades of research on safety, human error, and the underlying causes of accidents.⁵⁻⁷ Health care too could benefit from broader application of these principles, according to many patient safety experts. They suggest that system design, organization, and operation should bear the brunt of the responsibility for patient safety, rather than individual care providers or products.¹

Patient Safety: Where to Draw the Line

Where does patient safety end and public health protection begin? At the end of the day, it is a continuum with somewhat fuzzy boundaries. In this report, we focus on safe care. As a result, we include information about the safety of some hospital practices, but have excluded issues such as air and water quality or the safety of the health care workplace. Although they are outside the scope of this year’s report, these issues are clearly important. We’ve touched on them in previous reports and will likely do so again in the future.

Understanding Error and Adverse Events 4

The following diagram highlights the distinction between preventable and non-preventable adverse events. For example, if a patient receives a medication and experiences side effects known to be associated with that particular drug, but no error is committed, the drug side effect is a non-preventable adverse event. If however, an error is made, such as giving the wrong dosage, it is a near miss if it is caught in time and a preventable adverse event if it is not caught. Preventable adverse events include minor (some discomfort) or severe injuries, and may even cause death.



Source (adapted): Quality Interagency Coordination Task Force, *Doing What Counts for Patient Safety: Federal Action to Reduce Medical Errors and Their Impact (Report of the Quality Interagency Coordination Task Force [QuIC] to the President, February 2000)* (Rockville, MD: Quality Interagency Coordination Task Force, 2000).

* We have tried to be consistent with the terms used in this report. However, we also recognize and note that definitions differ between studies.

“Errors are like symptoms of diseases—they can be caused by multiple conditions, and treatment of the error or symptom does not correct the underlying malfunction. In both errors and symptoms, ‘cure’ requires attacking the underlying causes.”⁸

A “name, blame, and shame” approach, where someone is singled out and punished, is less productive than working to prevent the underlying causes of adverse events, experts argue.^{9,10} For example, if one pharmacist is disciplined for dispensing Celexa™ instead of Celebrex™, it will not change the fact that the medications have similar names and someone else could make the same mistake in the future.

Did You Know?

Adverse events can be devastating for the health professionals involved, as well as for patients and families. Numerous studies document the distress that caregivers can experience and discuss positive and negative coping strategies.^{11–14}

A multi-pronged, system-oriented approach has led to significant progress already in some areas. For example, researchers estimate that there used to be between one per 3,000 and one per 4,000 deaths in surgical anaesthesia cases in the U.S. Systematic attention to quality brought that down to one per 200,000 to 300,000, according to a 1998 study.¹⁵ Oxygen deprivation while a patient was under anaesthesia used to be one of the most common errors.¹⁶ It occurred when an oxygen connection was mistakenly inserted into the food tract (esophagus) rather than the airway (trachea). Likewise, it used to be relatively easy to switch the nitrous oxide and oxygen canisters used with anaesthesia machines. Today, different connectors help to prevent this mistake.

By studying these and other errors, improving procedures and system design, introducing standards of practice, and enhancing equipment training programs, anaesthesiologists have transformed their safety record over the past 30 years.¹⁶ But there is more work to do. In 2003, the Canadian Anesthesiologists’ Society established a Patient Safety Committee with tasks such as:

- Studying and preventing medical errors;
- Developing multi-disciplinary simulations to mimic critical incidents in operating rooms, birthing areas, critical care units, and emergency rooms; and
- Compiling an adverse outcome database, including refined definitions of critical incidents.¹⁷

Learning from Experience: When a Higher Error Rate Is a Good Thing

It may seem crazy, but experts say that one of the signs that a patient safety program is working is that more adverse events are reported. That’s because many types of events are typically under-reported, and learning opportunities are lost.¹⁸ For example, more than 70% of health professionals surveyed in 2003 said that under-reporting of adverse drug reactions was a very or somewhat serious problem in Canada today.¹⁹

Around the world, there is broad consensus in the patient safety community that encouraging more open reporting is one step to creating a culture of safety. Canada’s National Steering Committee on Patient Safety, the Institute of Medicine in the U.S., the Australian Safety and Quality Council, and the Department of Health in the UK, to name a few, all advocate this approach. An open system focuses on learning from past mistakes, rather than on blaming and punishing individuals responsible for particular errors.²⁰ The hypothesis is that, as health professionals are actively watching for safety hazards and are encouraged to share information about things that go wrong, they may become more aware of adverse events and near misses, and also be more likely to report them.

So if part of the solution is better sharing of information, what’s the problem? Health professionals report significant barriers to reporting; changing the culture is difficult, say experts. For example, 42% of Canadian physicians surveyed for the Commonwealth Fund in 2000 said that they felt discouraged from reporting, or not encouraged to report, medical errors. The associated administrative burden, fears of litigation, uncertainty about reporting procedures, and other factors may also represent barriers to reporting.^{19, 21}

What the Public Expects

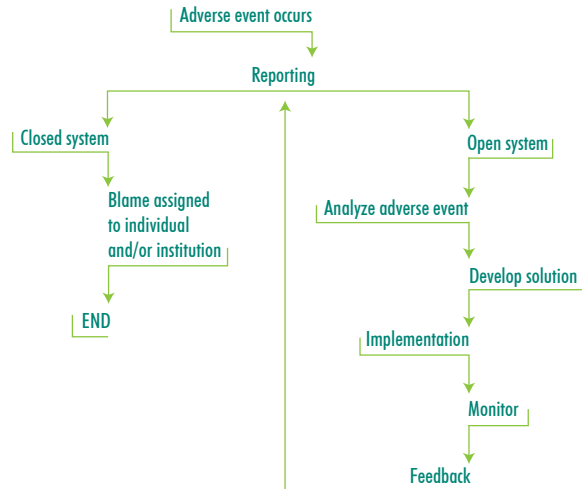
Patients typically want to be told about adverse events that affect them and want to feel that their experiences could be used for learning and to prevent similar problems in the future.²¹ The public also generally favours broader sharing of information to support quality improvement. For example, eight in 10 Canadians (82%) said that health professionals should be required to report all adverse drug reactions brought to their attention in a 2003 survey.^{†19} In comparison, 14% support the current voluntary system. Decima Research, which conducted the survey for Health Canada, suggests that the support for a mandatory approach reflects the perceived importance of drug safety and public health protection, as well as the belief that it would improve reporting.

Breaking the Silence

Efforts to encourage greater openness are underway across the country at local, regional, provincial/territorial, and national levels. They range from initiatives to encourage voluntary, anonymous disclosure as part of quality improvement initiatives to legislation requiring disclosure of adverse events. They also differ in focus, from reporting for broad quality improvement purposes to discussing particular incidents with patients.

What Does an Open System Look Like? 5

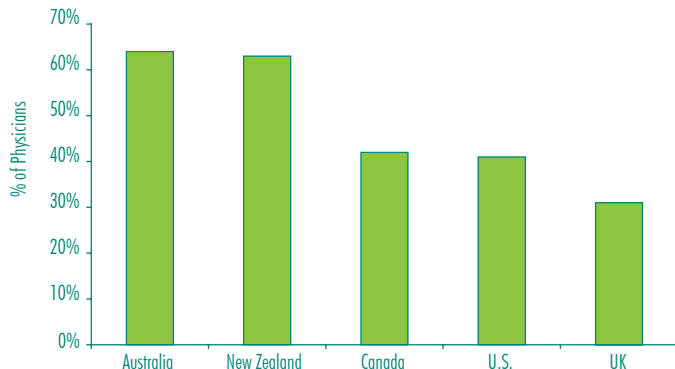
Safety experts often talk about the importance of the organizational culture and environment. They suggest that when medical errors occur within a “closed” system, blame is assigned (often to an individual health care provider) and the incident is “resolved” from the system’s point of view. Unless the media publicize the story, often only those who are directly involved will hear about the incident. However, in an open system, the focus is not on assigning blame. Rather, the goal is to feed the lessons learned back into the system and make changes in either practices or procedures to prevent future occurrences.



Source (adapted): National Patient Safety Agency, *Seven Steps to Patient Safety: A Guide for NHS Staff* (London: National Patient Safety Agency) [online], cited April 8, 2004 from <www.npsa.nhs.uk>.

Is Reporting Medical Errors Discouraged? 6

A 2000 survey by the Commonwealth Fund asked general practitioners and specialists working in five different countries whether they felt discouraged from reporting, or not encouraged to report, medical errors. Among Canadian doctors, 42% said yes, less than in Australia and New Zealand, but more than in the UK.



Source: R. J. Blendon, C. Schoen, K. Donelan, R. Osborn, C. M. DesRoches, K. Scoles, K. Davis, K. Binns, K. Zapert, “Physicians’ Views on Quality of Care: A Five-Country Comparison,” *Health Affairs* 20, 3 (2001): pp. 233–243.

View Data

† Survey results are estimated to be accurate to within ± 2.5 percentage points, 19 times out of 20.

Some reporting programs target particular types of adverse events. For example, many countries have developed a combination of voluntary and mandatory reporting mechanisms for medication incidents. In Canada, the federal government runs a system to capture reports on adverse drug events. In addition, Health Canada, CIHI, and the Institute for Safe Medication Practices Canada (ISMP Canada) recently developed a business case for the Canadian Medication Incident Reporting and Prevention System.²² The main goals of this long-term initiative are to support management of the risks associated with taking medications and to move towards reducing these risks. To accomplish this, the system would be designed to:

- “Collect and analyze standardized data on medication incidents;
- Facilitate the implementation of standardized reporting on medication incidents;
- Develop and disseminate timely, targeted information designed to reduce the risk of medication incidents; and,
- Develop and disseminate information on best practices in safe medication use systems.”²²

Medication Incident Reporting Systems: Some Examples

7

A number of medication incident reporting systems have been set up around the globe to help us learn from our experiences. The table below gives details on a snapshot of such programs.

	ISMP (MERP)	MedMARx	U.S. VA	MedWatch	Boots	AIMS
Country	U.S. and Canada	U.S.	U.S.	U.S.	UK	Australia
Scope	Individual practitioners and hospitals	Hospitals	Veterans’ Hospitals	Individual practitioners	Individual practitioners and stores	Hospitals
Voluntary/Mandatory Reporting	Voluntary	Voluntary	Sentinel events mandatory, rest voluntary	Voluntary	Mandatory	Voluntary
Non-Punitive/Punitive	Non-punitive	Non-punitive	Non-punitive	Non-punitive	Punitive (if incident is not reported)	Non-punitive
Types of Medication Incidents	All—both actual and near misses	All—both actual and near misses	All; focus on sentinel events	Actual incidents—related to product	Actual and near misses—related to distribution	All—both actual and near misses
Allows for Follow-up	Yes	No	Yes	Yes	Yes	No
Users Can Access Their Own Data for Risk Management	No	Yes	Yes	No	Yes	Yes

Source: Canadian Coalition on Medication Incident Reporting and Prevention, *A Medication Incident Reporting and Prevention System For Canada: Business Plan* (Ottawa: Canadian Coalition on Medication Incident Reporting and Prevention, 2002).

Other types of risks have also been the focus of dedicated efforts, sometimes after a high-profile incident raises awareness. For example, following an announcement that sterilization practices in two Ontario hospitals did not fully meet current infection standards, the Ministry of Health and Long-Term Care ordered an audit of procedures across the province. As a result, eight hospitals uncovered breaches in sterilization practices and reported to the Ministry that they had taken corrective action.^{25, 26} More recently, 12 Quebec hospitals announced that they would offer blood tests to some 1,200 patients who had had hip replacements.²⁷ These decisions followed a hospital's discovery, shared with others in the province, that staff had been washing and sterilizing a particular type of surgical instrument as a complete unit, rather than taking it apart first. As in Ontario, infectious disease experts believed that the risk to patients was minimal, but not absolutely zero.

In addition to issue-specific programs, there are initiatives that target a broad spectrum of safety issues. For example, many professional associations and regulatory bodies have adopted policies and guidelines to encourage or require their members to disclose adverse events. So have some health care organizations.²⁸ In some cases, particularly in hospitals, disclosures and discussions that occur through a recognized quality assurance process may be privileged under legislation, limiting their use in subsequent legal proceedings.²⁸

In some jurisdictions, legislation requiring disclosure also exists. For example, as of 2002, Quebec has required hospitals to inform patients when mistakes occur and to explain steps that will be taken to correct the error and prevent similar ones from happening in the future. Saskatchewan's legislation (2003) requires mandatory reporting of all medical errors to the Department of Health, and in British Columbia it became mandatory to report health professionals who pose a danger to the public in 2003.

Some suggest that policies and legislation should go further, perhaps towards a "no-fault" compensation approach for medical errors³⁰ as in Denmark, Sweden, Finland, and New Zealand.³¹ Under such an approach, compensation is based on what injuries occurred, rather than on whether or not care was negligent. Proponents believe that such a system would encourage open reporting and foster a learning environment. Those who argue against it believe that it would be costly and may remove incentives to provide quality care.³¹

Learning from Reporting

Health Canada began monitoring Accutane™, a drug used to treat severe acne, in 1983 when it first became available in Canada. As of 2003, Health Canada had received 222 reports of adverse events associated with the drug's use. Of these, 56 (25%) involved psychiatric side effects, such as depression and suicidal ideation.²³ In response to these and other reports, Canada, like the U.S., now requires patients to sign an informed consent form before getting the drug.²⁴ This procedure was put in place to ensure that patients had been told about its possible side effects.

Building the Culture

To monitor progress in changing the culture of silence around adverse events, some organizations are tracking staff and physician perspectives on patient safety. For example, a Calgary survey asked about whether staff and physicians had personally observed errors and whether they felt that errors went unreported. Credit Valley Hospital asked whether staff felt that their safety suggestions would be acted upon and whether they felt encouraged to report unsafe conditions. Similarly, in a 2003 survey at Nova Scotia's Capital Health Region, 75% of staff agreed that serious occurrences result from multiple small failures, rather than one's individual actions. Most also felt that they worked in an environment where patient safety was a high priority, but 44% felt that they would probably be treated negatively for reporting or disclosing errors or serious occurrences.^{‡29}

‡ The survey's response rate was 25%.

Accreditation: Safety Standards

Accreditation compares an organization's services and methods of operation against national standards, including some related to patient safety.³² Internationally, the Joint Commission on Accreditation of Healthcare Organizations in the U.S. established new standards requiring hospitals to disclose any unexpected outcomes to patients in 2001. A year later, a survey of close to 500 American hospitals found that only a third of respondents had a policy of disclosure in place. Just over half of respondents (54%) reported that disclosure was routine practice at their institution. Most of the remaining hospitals (44%) stated that they disclosed harm most of the time. Only a few (2%) never disclosed harm.³³

Accreditation and Patient Safety Indicators

The CCHSA collects data on information monitored by its member organizations. In its 2001 survey, CCHSA tracked patient safety indicators used by 75 health care organizations. Monitoring of the different themes varied, perhaps reflecting the fact that different types of organizations have different priorities.

Patient Safety Theme	Percentage of Organizations Collecting Indicators Related to Theme			
	Long-Term Care (N=20)	Acute Care (N=17)	Regional Health System (N=17)	Community Health Services* (N=21)
Infections	75%	71%	59%	14%
Falls	75%	76%	47%	10%
Abuse	20%	18%	24%	5%
Accidents/Incidents	75%	53%	53%	38%
Medication Errors	65%	53%	71%	5%
Access/Waiting	0%	47%	71%	48%
Readmissions	5%	47%	47%	0%
Human/Health Resources	35%	59%	53%	48%

N= number of health care organizations who completed the survey

Note: *Also includes home care and cancer services.

Source: Canadian Council on Health Services Accreditation, *The Use of Patient Safety Indicators by Health Care Organizations From the Accreditation Perspective: Final Report to Health Canada* (Ottawa: Canadian Council on Health Services Accreditation, 2003).

8

In Canada, the Canadian Council on Health Services Accreditation (CCHSA) covers a range of acute care, long-term care, and rehabilitation hospitals, regional health systems, home care programs, and other community based services. In 2001, CCHSA asked 75 organizations about the types of indicators they use to monitor patient safety. They found that different types of institutions tend to collect data on different patient safety themes, and there was little consistency in the definitions used by the different organizations.³²

Working Together

Patient safety is a shared responsibility. Legally, health care providers have a duty to act in the patient's best interest by providing appropriate and safe care.^{28, 34} Health care organizations are responsible for selecting competent and qualified staff, for providing proper equipment and facilities, and for ensuring a safe system of care. A hospital's liability also extends to the actions or omissions of its employees in relation to patients. Various government actions can also affect patient safety, including legislation, regulation, policies, programs, and support for information and research.

In 2003, Canada's First Ministers reaffirmed their commitment to health system renewal. Together, they pledged to ensure that "the health care services available to Canadians are of high quality, effective, patient-centred and safe."³⁵ This included directing health

ministers to implement the recommendations of the National Steering Committee on Patient Safety, a broad-based alliance of health professionals, health care providers, academics, and other relevant groups.

One of the committee’s key recommendations was the formation of a national patient safety institute. Launched in December 2003, the Canadian Patient Safety Institute (CPSI) has a mandate to provide a leadership role in patient safety issues by:

- Fostering the sharing of knowledge and information about optimal patient safety practices and models;
- Influencing change in culture and providing advice to support change in systems to improve patient safety; and
- Collaborating with stakeholders in an ongoing dialogue to support patient safety improvements.³⁶

An arms-length not-for-profit organization, CPSI’s governance structure includes both non-government and government members. A number of provinces have also established leadership and coordination mechanisms, including patient safety task forces and health quality councils.

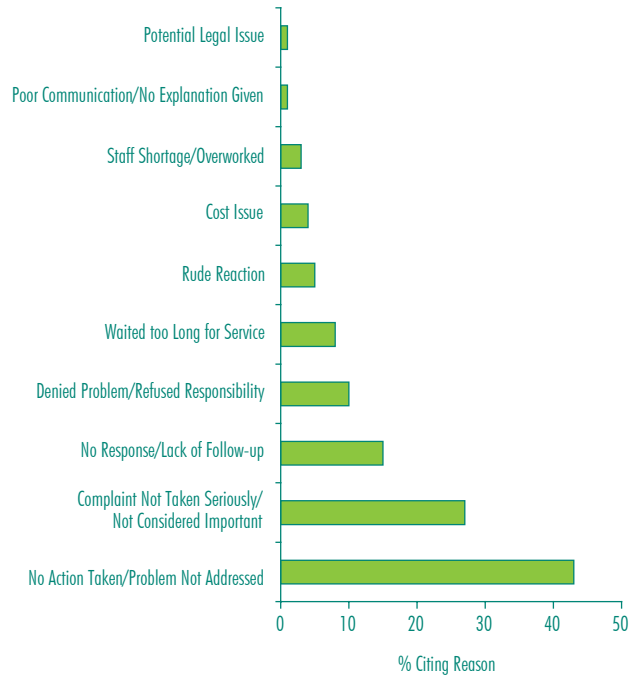
When Things Go Wrong: Patient Complaints About Care

In 2003, the Health Quality Council of Alberta (formerly the Health Services Utilization and Outcomes Commission) commissioned an Ipsos-Reid survey of more than 4,000 Albertans.³⁸ Overall,

- 15% of respondents who used the health care system in the last year said that they had a serious complaint about the care they received;
- Most (52%) reported their complaint in person, and a few (6%) wrote to someone about their situation;
- 41% did not report their complaint at all; and,
- Women (17%) were more likely than men (13%) to have a serious complaint, as were people aged 18 to 34 (18%) and 35 to 54 (15%), as compared to those 55 and older (10%).

Taking Enough Action to Address Complaints? 9

In 2003, 4,004 Albertans were surveyed about their experiences with the health care system. They were asked if they had complained either verbally or in writing about the health care they had received in the last year. In total, 15% had what they considered to be a serious complaint. Of those, 60% were dissatisfied with how their complaints were handled. The graph below shows the reasons for the dissatisfaction.



View Data

Source: Health Services Utilization and Outcomes Commission, *Health Services Satisfaction: Survey of Albertans* (Calgary: Health Services Utilization and Outcomes Commission, 2003).

Including Patients in an “Open” System

Sometimes overlooked, patients themselves can play a role in improving the safety of their care. For example, the Agency for Healthcare Research and Quality (AHRQ) in the U.S. suggests 20 tips to help patients be more involved in their own care, including:

- Be an active member of your health care team;
- Make sure all providers know which medications (prescription and over-the-counter) you are taking;
- Ensure that providers know about allergies and previous adverse drug reactions;
- Make sure you can read your prescription(s);
- Consider asking all health care workers who have direct contact with you whether they have washed their hands;
- Before going home, make sure you are clear about the necessary follow-up;
- If having surgery, make sure all agree on what is to be done;
- Do not assume no news is good news when waiting for test results; and
- Speak up if you have questions or concerns.³⁷

Patients may also promote safety in other ways. For example, some countries encourage patients to take an active role in reporting adverse events. For the past 25 years, the Consumer Institute for Medicines and Health (KILEN) in Sweden has provided patients with reporting forms for adverse medication reactions.³⁹

At the same time, experts remind us that not all patients are comfortable in, or equipped for, playing an active role in ensuring safe and effective care.³⁹ This may be particularly true when they are already vulnerable because of their condition or their care setting. Some suggest that family members or other advocates may be able to take on some of the responsibility when patients are unable to act on their own behalf.³⁹

For More Information

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Patient Safety—A Worldwide Challenge

3



Patient Safety—A Worldwide Challenge

It made the headlines, the TV news, and even temporarily bumped speculation about the federal election off some chat shows. Given the attention paid to the release of the first national study on adverse events in Canadian hospitals, one could be forgiven for thinking that patient safety is a brand-new concern.

The study was groundbreaking, but the underlying issue is neither new nor unique to Canada. As early as the 17th century BC, Hammurabi's Code outlined punishments for harm resulting from physician care. Many centuries later, Hippocrates admonished physicians in ancient Greece to do no harm. More recently, Florence Nightingale in Europe and Ernest Codman in the U.S. argued for the importance of tracking and learning from outcomes of care.

Modern medicine has made considerable progress since then, but researchers worldwide continue to find cases where health care harms patients. Some are preventable; others are not, at least with our current knowledge base.

This chapter highlights the results of recent patient safety studies from around the world. Researchers have used a wide range of approaches, including analyzing administrative data, tracking malpractice claims, reviewing patient charts, and asking patients and their families about their care. The estimates of the resultant adverse event rates differ, but together they suggest that patient safety is an important issue for health care systems around the world.

Researching Patient Safety

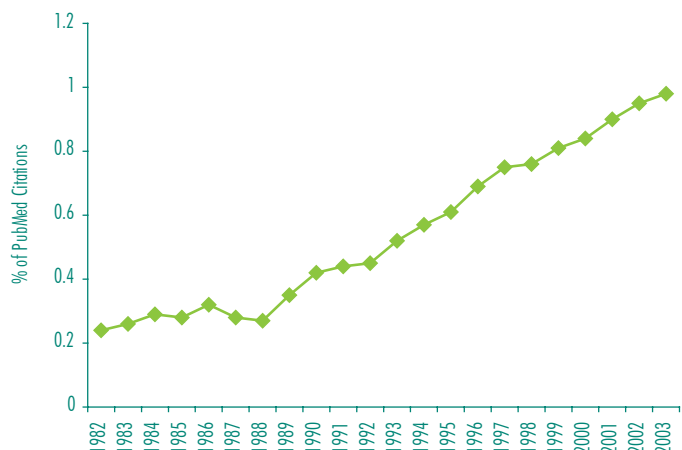
The number of studies on patient safety is soaring. Close to a century ago, when the *Journal of the American Medical Association* published a comparison of diagnoses based on autopsy and clinical findings, quality of care was a relatively rare area of study. (The author found a 40% error rate in diagnosis. He attributed it to an over-reliance on X-rays and system errors that were "inevitable at this time."¹)

By 2003, almost 1% of publications in the National Library of Medicine's electronic database (PubMed) dealt with patient safety or medical errors—more than four times the level in 1982. Nevertheless, research suggests health care may be more risky than is generally believed, even based on published rates. For example, a 2002 survey found that U.S. physicians and the public believed that fewer deaths resulted from medical errors in hospital than the Institute of Medicine's report suggested.³

Growing Academic Interest

10

Using the National Library of Medicine PubMed citation service, we conducted a year-by-year search of abstracts using "patient safety" and "medical error" as keywords. The graph below shows the proportion of total papers cited (as of January 28, 2004) that included these topics during each calendar year between 1982 and 2003.



Note: Certain types of publications are not included, such as government reports.

[View Data](#)

Source: Compiled by CIHI.

What Patients Say

Patient safety has joined the long list of common challenges—from unemployment to the environment—that Canada shares with other developed countries. Surveys regularly find that 20 to 50% of adults have experienced an adverse event in their own or their family’s health care.

In 2002, the Commonwealth Fund asked adults with health problems in five countries about medical and medication errors. Close to a quarter of respondents in Australia, Canada, New Zealand, and the U.S. reported one or the other in the past two years. Rates in the UK were slightly lower, at 18%. Over half of those who reported an error (51 to 63%) said that it caused serious health problems.²

Broader surveys of the population as a whole have also been conducted. In the U.S., 42% of adults in 2002 said that they, or a member of their family, had experienced a preventable medical error in their care; 10% said that it had led to a death.³ Nevertheless, only 5% of physicians and 6% of the public identified medical errors as one of the most serious health care problems. Both groups were more likely to be concerned about health care costs than safety.

What Causes Errors? A View from the U.S.

In a 2002 survey,³ American physicians and members of the public agreed on two possible causes of medical errors: a shortage of nurses (53% of physicians identified this, compared with 65% of the public) and overworked, stressed, and fatigued health care providers (50% versus 70%). The public also frequently cited too little time with physicians (72%) and health care providers not working as a team or not communicating (67%).

According to the survey, both the public and physicians held individual health care professionals personally responsible for errors. The public saw reporting as a very effective way of reducing errors and wanted reports made available. Physicians, however, generally preferred that reports be kept confidential. In a 2003 survey,⁵ less than one in five executives of large hospitals in Canada (18%) and the UK (15%) thought that medical error rates should not be made public. U.S. executives were less comfortable—40% thought that this information should not be disclosed.⁴

Mistakes Causing Serious Health Problems

11

The 2002 Commonwealth Fund International Health Policy Survey asked sicker adults* from Australia, Canada, New Zealand, the UK, and the U.S. about medical and medication errors in the past two years. More than half of those who believed that they had experienced an error in each country said that it had been associated with serious health problems.

	Australia	Canada	New Zealand	UK	U.S.
Believe a medical mistake was made in own treatment or care	19%***	20%†	18%***	13%**	23%
Given the wrong medication or wrong dose by a doctor, hospital, or pharmacist	11%	11%	13%	10%	12%
Either type of error was made	23%***	25%†	23%***	18%**	28%
Medical mistake caused a serious health problem (as a percent of those who experienced an error)	55%	60%	60%	51%**	63%

*The sample of “sicker adults” includes respondents aged 18 or older who met at least one of four criteria: reported their health as fair or poor; reported that they had a serious illness, injury, or disability that required intensive medical care in the past two years; or reported that in the past two years they had undergone major surgery or had been hospitalized for something other than a normal, uncomplicated delivery.

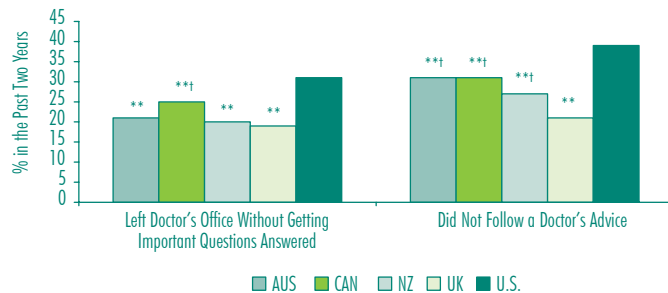
Notes: **Statistically significantly different from U.S. †Statistically significantly different from the UK

Source: R.J. Blendon, C. Schoen, C. DesRoches, R. Osborn, K. Zapert, “Common Concerns Amid Diverse Systems: Health Care Experiences in Five Countries,” *Health Affairs* 22, 3 (2003): pp.106–121.

Communicating With Doctors

12

Research suggests that good communication between patients and their health care providers promotes safe care. According to a 2002 survey by the Commonwealth Fund, at least one in five sicker* adults in Canada and four other countries said that they left their doctor’s office without getting important questions answered and did not follow a doctor’s advice at some point during the previous two years.



*The sample of “sicker adults” includes respondents aged 18 or older who met at least one of four criteria: reported their health as fair or poor; reported that they had a serious illness, injury, or disability that required intensive medical care in the past two years; or reported that in the past two years they had undergone major surgery or had been hospitalized for something other than a normal, uncomplicated delivery.

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[View Data](#)

§ Based on results of the 2003 Commonwealth Fund International Health Policy Survey. Response rates varied from 20% in the U.S. to 82% in New Zealand. The survey included 200-plus bed hospitals in the UK and the U.S. and 100-plus bed hospitals in other countries.

What the Public Says: Views Across the 49th Parallel

13

Two surveys, one conducted in the U.S. in 2002, the other in Canada in 2003, asked citizens about their experiences with mistakes that result in serious harm, such as death, disability, or additional or prolonged treatment. Both surveys used the same definition; but in Canada, these situations were referred to as “adverse events,” whereas the U.S. survey called them “medical errors.” The extent to which this wording difference affects comparability is not known.

	Canada	U.S.
Ever had an adverse event (medical error) occur in own care or that of a family member	24% said “yes”	42% said “yes”
The latest adverse event occurred in the past year (as % of those reporting events)	30% said “yes”	N/A
The latest adverse event (medical error) resulted in serious health consequences	52% said “yes”	56% said “yes”
The latest adverse event caused you or your family member to go to or stay longer in the hospital	68% said “yes”	N/A
The latest adverse event (medical error) resulted in death	6% said “yes”	10% said “yes”

Notes: The Canadian survey includes adults 15 years of age and older; the American survey includes adults 18 years of age and older.

Sources: **Canada** Canadian Institute for Health Information (survey conducted by The Berger Population Health Monitor), (Toronto: CIHI, 2004).

U.S. R. J. Blendon, C. M. DesRoches, M. Brodie, J. M. Benson, A. B. Rosen, E. Schneider, D. E. Altman, K. Zapert, M. J. Herrmann, A. E. Steffenson, “Views of Practicing Physicians and the Public on Medical Errors,” *New England Journal of Medicine* 347, 24 (2002): pp. 1933–1939.

A Canadian survey in late 2003 asked similar questions.[†] Both surveys focused on occasions when ill people receive medical care and mistakes are made that result in serious harm, such as death, disability, or additional or prolonged treatment. Respondents were told that sometimes, but not always, these situations are preventable. These definitions were identical, but the U.S. survey used the term “medical errors.” In Canada, they were referred to as “adverse events.” Perhaps partly because of this difference in wording, results in Canada varied from those in the U.S. 24% said that they, or a member of their family, had experienced a preventable adverse event in their care. And only 6% said that the most recent event had led to death.

Hospital Safety: Reviewing Patient Charts

Modern hospital care is complex and often high-risk. Researchers in a number of countries have reviewed samples of patient charts to identify how often adverse events occur.

The Harvard Medical Practice Study led the way in 1991. A random review of more than 30,000 charts estimated that medical errors occurred in about 4% of all admissions.⁵ The Institute of Medicine combined these results

with those from a large study in Utah and Colorado in its landmark *To Err Is Human* report.⁶ Overall, the report estimated that 44,000 to 98,000 Americans die each year because of preventable medical errors in hospitals. That’s more than die annually of motor-vehicle accidents, breast cancer, or AIDS.

Following the Harvard study, researchers in Australia, Canada, Denmark, and elsewhere used similar methods to determine the incidence of adverse events in their hospitals. This approach includes:

- Identification of a random sample of charts for review;
- Screening of charts by a trained nurse, looking for a pre-defined series of criteria known to be associated with adverse events (e.g. return to the operating room or death in hospital);
- Physicians’ scoring of charts which meet the screening criteria based on their confidence that an adverse event occurred, typically using a six-point scale; and
- Scoring of identified adverse events by physicians (most studies) based on the likelihood that they could have been prevented.

[†] The Institute for Social Research at York University conducted the survey for CIHI in conjunction with the Berger Population Health Monitor. The response rate was 52%.

Worldwide, studies estimate relatively similar rates of serious adverse events. Less than 2% of patients in hospital die or suffer a major disability as a result of “unintended injury or harm to a patient, caused by health care management, rather than a disease process which led to hospitalization, prolongation of hospital stay, morbidity at discharge, or death.”⁷ There is wider variation in estimates of total adverse event rates. For example, the Australian study reported about six times as many cases of minor disability as the Utah/Colorado study.⁸

Is quality of care really different? While all studies followed the same basic steps, important methodological differences may affect comparability of results, including:

- Some studies exclude specific patient groups (e.g. obstetrics or short-stay patients);
- Screening criteria vary (e.g. some studies would count a cancelled or postponed operation not resulting in increased morbidity as a “harm,” while others would not);
- Timing criteria differ (e.g. whether to count adverse events that occurred during the admission being studied, but that were discovered after discharge);
- Confidence thresholds to define an adverse event vary (in some cases, two out of six points or “slight to modest evidence” of causation by health care management is deemed sufficient; others require a score of at least four points, representing a judgement that it was “more likely than not” to have resulted from medical management); and
- The number of medical reviewers differs.

These methodological differences can significantly affect results. For example, there was a 13.7% gap between total adverse event rates in the published Australian and Utah/Colorado results. After taking five methodological differences into account, the gap was cut almost in half, to 7.4%.⁷

Chart Review Studies on Patient Safety

14

Researchers in several countries have reviewed medical records in order to determine the incidence of adverse events in hospitals and what proportion were preventable. They all used a methodology similar to the Harvard Medical Practice study done in 1991, although there are some important differences that may affect the comparability of results.

Country (Year)	Number of Charts Reviewed	% With Any Adverse Event	% of Total Adverse Events Considered Preventable
Canada (2000–2001)	3,745	7.5%	37%
France (Not Indicated)	778	14.5%	28%
New Zealand (1998)	6,579	12.9%*	37%
England (1999)	1,014	10.8%	48%
Denmark (1998)	1,097	9.0%	40%
U.S.—Utah and Colorado (1992)	14,700	2.9%	N/A
Australia (1992)	14,179	16.6%	51%
U.S. Harvard Medical Practice Study New York (1984)	30,195	3.7%	N/A

*Adverse events were associated with 12.9% of admissions sampled. The incidence rate (only incidents recorded during the sampled admission) was 11.2%.

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Chart Review Studies: Comparison of Methodologies

Chart review studies have now been conducted in a number of countries. The chart below describes some of the key methodological differences between studies. Other differences, such as the number of reviewers per chart or the period of review before/after the index admission, may also exist (e.g. whether adverse events that occurred during a hospital stay but were not identified until after discharge were counted).

Country (Year)	Purpose/Orientation of Study	Setting	Definition of Adverse Event	Threshold for Defining Adverse Event	Patient Population
Canada (2000–2001)	Quality improvement	20 acute care hospitals in five different provinces	An unintended injury or complication which results in disability at the time of discharge, death, or prolonged hospital stay and is caused by health care management, rather than the underlying disease process	Score of 4 or more	Adult acute care inpatients (excluding specialty hospitals, such as paediatric centres, mental health, and rehabilitation); psychiatric, obstetric, and short-stay patients were excluded
France (Not Indicated)	Methodological comparison	37 wards in seven hospitals in southwestern France	An unintended injury caused by medical management rather than by a disease process which resulted in death, life-threatening illness, disability at time of discharge, admission to hospital, or prolonged hospital stay	N/A	Inpatients in medical, surgical, and obstetric wards in acute care hospitals
New Zealand (1998)	Quality improvement	13 generalist hospitals providing acute care	An unintended injury resulting in disability caused by health care management rather than the underlying disease process	Score of 4 or more	Inpatients in general hospitals, excluding day, psychiatric and rehabilitation-only cases
England (1999)	Quality improvement	Two acute care hospitals in greater London area	An unintended injury caused by medical management rather than by the disease process	Score of 4 or more	Acute care hospitals—general medicine, general surgery, orthopaedic surgery, and obstetrics
Denmark (1998)	Quality improvement	17 different acute care hospitals	Not indicated in abstract	N/A	Patients admitted to acute care hospitals
U.S.—Utah and Colorado (1992)	Medico-legal	13 hospitals in Utah and 15 in Colorado (ranging from large teaching to rural, government, for-profit, and not-for-profit)	An injury caused by medical management (rather than the disease process) that resulted in either a prolonged hospital stay or disability at discharge	Score of 4 or more for determination of an adverse event or negligent adverse event	Study included children and adults, but excluded psychiatric, rehabilitation, and drug alcohol treatment diagnosis-related groups and hospitals that exclusively provide those services (also Veterans Administration Hospitals)
Australia (1992)	Quality improvement	28 hospitals in New South Wales and South Australia	An unintentional injury or complication which results in disability, death, or prolonged hospital stay and is caused by health care management	Average score of 2 or greater for the two reviewers	Acute care hospital patients, excluding day-only admissions and admissions to psychiatric wards
U.S. (1984)	Medico-legal	51 randomly selected acute care, nonpsychiatric hospitals in New York State	An unintended injury that was caused by medical management and that resulted in measurable disability	Score of 4 or higher	Non-psychiatric patients from non-federal acute care hospitals

Researchers also suggest that the aims and orientation of the studies may affect results. The Utah/Colorado study was designed to help compare the cost of a no-fault insurance system for medical malpractice to that of the standard tort system. Other countries' studies had a quality improvement orientation. They aimed to estimate adverse event rates and preventability.

No one knows for certain how much this difference contributed to variations in results across studies. But researchers involved in the Utah/Colorado and Australian research suggest that it may explain why many more minor events were reported in Australia.⁸ Supporting their position, they point out that studies using different methods typically find much higher rates than were measured in the Utah/Colorado study for some common but relatively minor types of adverse events, such as pressure ulcers and urinary tract infections.

Regardless of differences in methods and results, there is widespread agreement that adverse event rates are higher than desirable around the world.¹¹ Substantial numbers of patients suffer, and even die.

Internationally, there also appears to be a general consensus on what might help to improve patient safety. For example, most hospital executives in Australia, Canada, New Zealand, the UK, and the U.S. in 2003 felt that the following strategies would be somewhat or very effective in improving quality of care:

- Bar coding medications: 77 to 93% of respondents agreed;
- Electronic medical records: 80 to 89%;
- Outcome comparisons with other hospitals: 81 to 93%;
- Electronic ordering of drugs and medical tests: 84 to 93%; and
- Standard treatment guidelines: 93 to 100%.⁴

Publication of study results, as well as high-profile inquiries into specific events, has galvanized action on these and other fronts. At a national/provincial level, new focal points have been set up, legislation enacted, research conducted, and reports published (see the appendix at the end of this report for more information). A number of professional associations, hospitals, and health care providers have also moved forward. We'll be watching as results emerge in future years.

The Measurement Paradox

When it comes to patient safety, how you measure adverse events matters. Broad-based chart reviews and prospective studies that track outcomes from a given point forward (e.g. a hospital admission) find different results than do cross-sectional studies conducted at a specific point in time.⁹ Studies focused on specific issues, such as urinary tract infections or medication errors, also produce different results.^{8,9}

Along with the methodological differences in international chart review studies described earlier, this may help to explain the paradox of the U.S. results—adverse event rates that are as high as those in other countries based on surveys and studies of specific issues, but lower rates based on large-scale chart reviews. Of course, there may also be true quality differences, but it's not clear how large they are or which country performs best. Whichever approach is used, many experts argue that adverse events and near misses are under-reported.¹⁰

Improving Patient Safety the VA Way

Lower costs. Raise patient satisfaction. Improve access to and quality of care. Achieving any one of these goals is a challenge, but the U.S. Department of Veterans Affairs (VA) managed all three, in just a few short years.^{12,13}

The VA provides primary care, specialized care, and related medical and social support services to U.S. veterans. It operates more than 160 hospitals nation-wide.

After an internal report estimated that 3,000 errors had contributed to 700 patient deaths within a year and a half, the VA opted for a multi-faceted approach to error reduction in veterans' hospitals.¹⁴ The organization made changes in everything from administrative procedures to technology support, nurse training, and medical practice. For example, they implemented a barcode system for medication that verifies that the right drug and dose are given to the right patient. Following its implementation, the medication error rate at two VA hospital test sites fell by 70% over a five-year period. The VA also introduced new medication storage procedures to remove hazardous drugs from patient areas, implemented an electronic medical record, adopted a no-restraint policy, encouraged continuing education among staff, and worked with NASA to establish a reporting system that not only collects information about patient safety issues, but also analyzes it and makes recommendations for corrective action.

It's Not Just About Hospitals

Patient safety has mostly been studied in hospitals, but it's also important elsewhere.¹⁵ For example, in a 1999 survey, Australian adults were more likely to report an adverse event related to care in a doctor's office, than to services in hospitals or the home.¹⁶

The prevalence of adverse events in primary health care is perhaps not surprising, since many more people experience this type of care than have hospital stays. In addition, the complexity of office-based care may be increasing over time as patients are discharged earlier and care is transferred to community settings.¹⁷

A literature review found that "threats" to patient safety ranged from five to 80 per 100,000 primary health care consultations, most not causing harm to the patient. They also found that prescribing and prescription errors occurred in up to 11% of all prescriptions. Even these rates may be underestimates, according to the review's authors, since most studies reviewed relied on opportunistic incident reporting to collect data.¹⁸

16

Safety of Blood Supplies— An International Perspective

We've all heard how the miracle of lifesaving blood products turned into a devastating aftermath for recipients who acquired HIV, hepatitis, or other diseases from transfusions. While transfusions of blood and blood products will never be without risk, receiving tainted blood is mostly a memory. Donors and donated blood are now screened for a wide variety of risk factors and diseases, at least in developed countries. The tests used vary from country to country and may change over time as new methods are developed. However, these tests are not perfect. The chart below compares "residual risks" or recent estimates of the number of units of infected blood per million donations that escape detection in American Red Cross Blood Centers, in Canada and in five other countries.

	HIV	Hepatitis B	Hepatitis C
Quebec (1997–2002)	0.2	3.6	0.8
Canada Excluding Quebec (1990–2000)	0.1	13.9	0.4*
American Red Cross Blood Centers (1995–2001)	0.5	4.9	0.5
Australia (2000–2001)	0.3	2.1	1.1
England (1993–2001)	0.1	3.9	0.03**
France (1998–2000)	0.7	2.1	1.2
Spain (1997–1999)	2.0	13.5	6.7
Italy (1994–1999)	2.5	15.8	4.4

*1999–2000
** 1999–2001

Notes: Each country has different standards for testing blood donations. As well, the tests used change over time as new methods are developed. This may explain part of the variation among the different countries. The methods for calculating these estimates also differ somewhat between studies, although all those shown here take disease incidence in the donor population and test window periods into account in their models. Some also take testing error and test sensitivity and specificity into account. As a result, comparisons between countries should be made with caution.

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Looking across a range of studies and through consultations with experts, UK researchers identified four key safety issues in primary health care:

- **Diagnosis:** inappropriate referrals and high volume of referrals needed to determine a diagnosis;
- **Prescribing:** prescribing the wrong drug, ignoring allergies, and errors in dispensing;
- **Communication:** breakdown between hospital and community services; and
- **Organizational change:** need organizational culture where there is teamwork, communication, and leadership in reducing errors.¹⁹

Information Gaps: Some Examples

What We Know

- The percentage of adults in several countries who report that they or a family member have experienced an adverse event, and how many suffered serious health consequences from the event.
- Chart review–based estimates of rates of adverse events in hospital in a number of countries (and what proportion are preventable), although results from all studies are not directly comparable.
- Pockets of information on specific risks, such as transfusion-transmitted infection of HIV and hepatitis in selected countries.
- Patient safety has become an important policy issue in many countries, including the U.S., the UK, Australia, New Zealand, and Denmark.

What We Don't Know

- How do adverse event rates in hospital compare across countries and over time? What are the resultant impacts on population health; on costs to the health system; and on patients, families, and health care providers?
- How often do adverse events occur outside of hospital? What is the nature and impact of these events?
- What methods are most effective for capturing the true extent of minor and serious adverse events, as well as near misses?
- What policies, strategies, and practices are most effective in improving patient safety? What are their relative costs and benefits? How can countries best work together to improve patient safety across the health care continuum?

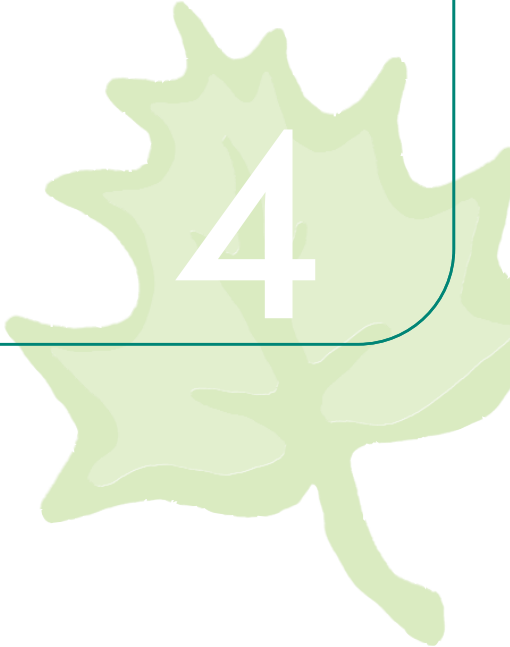
What's Happening

- Several countries, including Canada, are collaborating with the Commonwealth Fund to define patient safety indicators and share comparable data.
- Many countries continue to announce new initiatives aimed at improving patient safety. For example, England and Wales recently launched a national patient safety reporting system that will draw together reports of patient safety errors and system failures.
- The International Alliance for Patient Safety was created in November 2003, bringing together countries, interested bodies, and experts for the promotion of patient safety in member states of the World Health Organization. The Alliance aims to accelerate improvements in patient safety in countries through its core functions: supporting the development of patient safety policy and practice; enabling countries to assess their progress towards patient safety; global reporting; solution development; and research and development.
- A wide range of patient safety research is underway. For example, B.C.-based researchers are exploring the cost-effectiveness of a wide range of specific patient safety improvements at the Vancouver Island Health Authority and the Missouri Baptist Medical Center.

For More Information

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To Err Is Human . . . in Canada Too





To Err Is Human . . . in Canada Too

Published years before, three little-known research studies made headlines across the U.S. in November 1999 and catapulted patient safety to the top of the political agenda. Within days, President Clinton declared it the top priority for federal agencies with health care responsibilities.

The Institute of Medicine triggered this media maelstrom. Their report, *To Err Is Human: Building a Safer Health System*,¹ drew attention to the 44,000 to 98,000 Americans who die each year as a result of what were termed “medical errors” in hospital. The report’s authors called for sustained efforts to improve patient safety throughout the U.S. As it was meant to, the message hit home—loud and clear.

Canadian data show that we too have opportunities to make care safer, both inside and outside of hospitals. This chapter looks at what we know and don’t know about the situation here. It includes estimates of the nature and extent of adverse events based on reviews of patient charts, surveys, litigation information, and administrative data.

About the Canadian Adverse Events Study

The Canadian Adverse Events Study² is the first national study of the incidence of adverse events in Canadian hospitals. CIHI and the Canadian Institutes of Health Research cosponsored the study.

- The researchers defined an adverse event as “an unintended injury or complication, which results in disability at the time of discharge, death, or prolonged hospital stay and is caused by health care management rather than the underlying disease process.”
- A total of 20 hospitals were selected for the sample: one large teaching hospital with full-time core residency programs in medicine and surgery, one large community hospital with 100 or more beds, and two small community hospitals with less than 100 beds in each of the following five provinces: Nova Scotia, Quebec, Ontario, Alberta, and British Columbia.
- Hospitals with fewer than 1,500 separations per year and specialty hospitals, such as paediatric centres, mental health facilities, and long-term care facilities were not included in the sample. (A separation is when a person leaves a hospital, either through discharge or death.)
- Chart reviews were used to identify adverse events and assess whether these events might have been prevented. This methodology was similar to that of the Harvard Medical Practice Study, further developed by researchers in Australia and the UK. (See Chapter 3 for more information.) About 3,700 patient records were reviewed in Canada.
- Physician reviewers judged the degree to which an adverse event could have been prevented using a six-point scale from “virtually no evidence” to “virtually certain evidence” for preventability.

Two-Stage Review Methodology

17

Each province had two review teams. The first team was led by a senior nurse with experience in chart review, and the second team consisted of physician reviewers who had been in practice for at least five years. The table below outlines the teams’ main tasks.

	First Stage	Second Stage
Reviewers	Nurses or health records personnel	Physicians
Focus of Review	Identify charts with one or more of 18 screening criteria, such as (partial list): <ul style="list-style-type: none"> • Unplanned readmission • Adverse drug reaction • Patient injury in hospital • Unplanned return to the operating room • Unplanned transfer from general care to intensive care • Unexpected death 	For each chart identified in the first stage: <ul style="list-style-type: none"> • Identify the presence of any unintended injuries or complications • Classify injuries based on any association with death, disability at discharge, prolongation of stay, subsequent hospitalizations, interventions without sequelae or outpatient visits • Determine the extent to which health care management, rather than the disease process, was responsible for the injury • Judge preventability

Source: G. R. Baker, et al. “The Incidence of Adverse Events in Canadian Hospitals,” *Canadian Medical Association Journal* (2004): in press.

Searching the Records: When Bad Things Happen in Hospital

Before May 2004, experts assumed that Canada too had significant rates of adverse events in hospital. Now we know. A coalition of researchers from across the country recently released the findings of the largest-ever study of adverse events in Canadian hospitals.² The team reviewed just over 3,700 patient records in five provinces using methods similar to those employed in other countries (see Chapter 3 for details).

The study estimated that adverse events occur in 7.5% of admissions in non-specialized acute care hospitals in Canada. Of these, expert reviewers considered 37% highly preventable. The most common types of adverse events were:

- Events related to surgical procedures: 123 (34% of the total)
- Drug- or fluid-related events: 85 (24%)

Most patients who experience adverse events recover within six months, but about 21% who had an event later died. (Researchers note that in the absence of an event some would likely have died as a result of their existing medical condition.) If similar rates apply across the country, that would mean that between 9,250 and 23,750 people per year experience a preventable adverse event and later die. That's more than the number who die from breast cancer, motor vehicle and other transport accidents, and HIV combined.

Adverse events also lead to significant costs for the health system. For example, researchers estimate that the 255 patients with adverse events detected in the study stayed about 1,521 extra days in hospital because of the event. If similar rates prevail across the country, more than 1.1 million days could be attributed to adverse events. That's close to the number of days used each year by all women hospitalized during pregnancy and childbirth.

Seven Leading Causes of Death in Canada 18

More than 218,000 people died in Canada in 2000. The chart below shows the seven leading causes of death and the number of deaths they represent.

Cause	Number of Deaths
Ischaemic heart disease (e.g. heart attack)	42,417
Cancer of the respiratory and intrathoracic organs (e.g. lung cancer)	16,774
Cancer of the digestive organs (e.g. colorectal, pancreatic, and stomach cancer)	16,542
Cerebrovascular disease (e.g. stroke)	15,576
Other forms of heart disease (e.g. congestive heart failure)	10,641
Chronic lower respiratory diseases (e.g. COPD)	9,813
Diabetes mellitus	6,714

Source: Vital Statistics Death Database, Statistics Canada.

There's More . . .

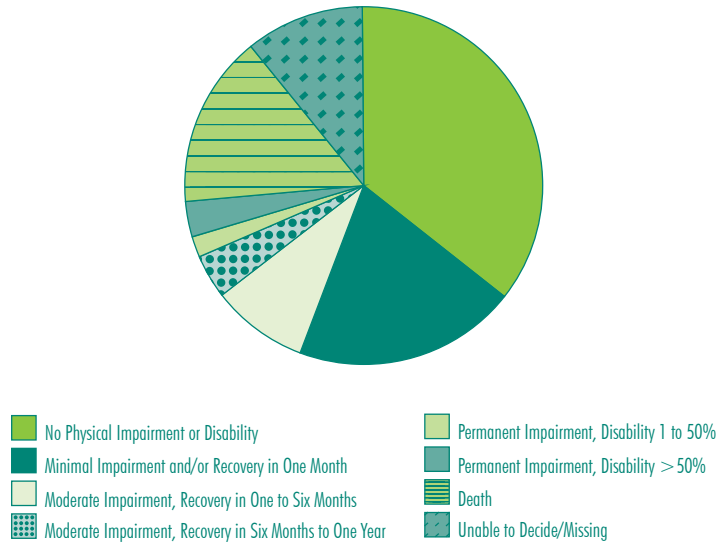
While the recent hospital-based study is the largest of its kind in Canada, other smaller chart review studies do exist.

For example:

- Ottawa researchers used a combination of telephone interviews and chart reviews to follow general internal medicine patients after they were discharged home or to a senior's residence during a 14-week period in 2002. Almost one in four (23% of 328 patients) experienced at least one adverse event, mostly drug-related, after discharge. Most events had relatively minor consequences (68% involved symptoms only), but 6% were associated with a permanent disability or death. Overall, reviewers judged about half of the events preventable or ameliorable.³
- Using a variety of approaches, including chart review, researchers at the Hospital for Sick Children in Toronto prospectively monitored the experience of children admitted for general surgery in one month in 2002. They found that about two-thirds of the children experienced an adverse event during their stay. Just over a quarter of events (28%) resulted in adverse outcomes, the most common of which was a need for additional non-operative procedures.⁴
- A study published in 2003 found that 19% of 400 patients discharged from a large urban hospital suffered adverse events that affected them after discharge; about 30% were preventable.⁵
- In 1996, a Toronto hospital studied adverse events in surgical patients.⁶ Researchers found that 39% of surgical patients suffered complications; 18% of the 144 complications identified were potentially attributable to error.

Results From the Canadian Adverse Events Study 19

The human cost of errors is high. About 7.5% of adult medical and surgical patients in Canadian acute care hospitals experienced an adverse event in 2000–2001. The chart below shows the relative distribution of outcomes for these patients. When adjusted for sampling strategy, expert physician reviewers believe that about 37% of the total number of events were preventable.

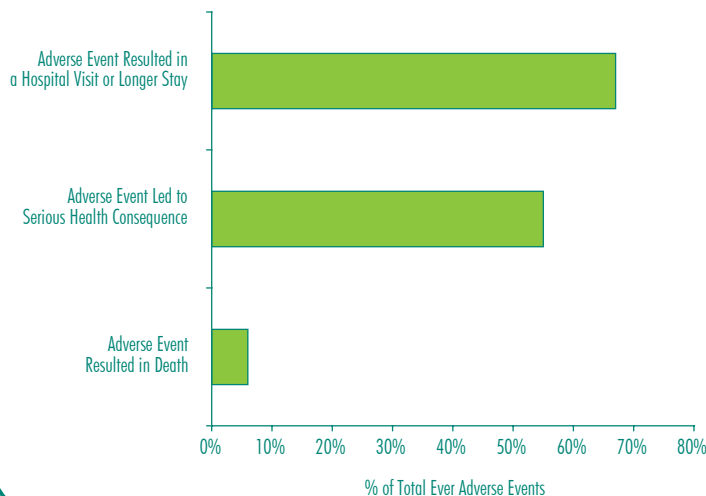


Source: G. R. Baker, et al. "The Incidence of Adverse Events in Canadian Hospitals," Canadian Medical Association Journal (2004): in press.

[View Data](#)

What Canadians Say 20

In 2003, 24% of Canadian adults said that they or a family member had ever experienced a preventable adverse event: 30% of these respondents reported that the event occurred in the past year. The graph below shows the proportion of respondents who said the most recent preventable adverse event resulted in a longer hospital stay, serious health consequences, or death.



Source: A survey conducted as part of the Berger Population Health Monitor by York University's Institute for Social Research, for The Canadian Institute for Health Information, 2004.

What Canadians Say About Care in Hospital and Beyond

Reviewing patient charts is one way to evaluate patient safety; another is to ask Canadians about their experiences regarding care.

In 2003, CIHI commissioned a survey to do just that. York University's Institute for Social Research surveyed more than 1,000 Canadians aged 15 and older during the months of October and November 2003 as part of the Berger Population Health Monitor. About one in four Canadians (24%) said that they had experienced a preventable adverse event in their own health care or that of a family member. That translates to about 5.2 million people nationwide. Of those who had experienced an event, about half (52%) said that the most recent event had had serious health consequences.

Some provinces have also conducted surveys. For example, the Health Quality Council of Alberta (formerly the Health Services Utilization and Outcomes Commission) surveyed more than 4,000 Albertans in 2003 to assess general perceptions and actual experiences related to health services quality, access, safety, and satisfaction. Albertans identified patient safety as the second most important factor associated with quality health care, after accessibility. Fourteen percent of respondents reported that they or a member of their immediate family had experienced a medical mistake in the past year that resulted in serious harm, such as death, disability, or prolonged treatment. In total, about 30% of respondents said that they were concerned about medical mistakes made in the course of their care and treatment (but 45% were not).⁷

Complaints and Litigation

Many more people report experiencing adverse events than lodge official complaints or initiate legal action. For example, 41% of Albertans who said that they had a serious complaint about health services in the past year in 2003 did not report it to anyone.⁷

What Albertans Care About

The impact that care has on health was one of the factors that Albertans cited most often as influencing their satisfaction with services. The top four factors for seven types of care are shown below.

	1	2	3	4
Family Doctors (GPs)	Thoroughness of exam	Impact of care on health and life	Doctor spending enough time with you	Listening carefully to your concerns
Walk-in Clinics	Thoroughness of exam	Quality of care provided	Doctor spending enough time with you	Impact of care on health and life
ER Services	Time between nurse's assessment and doctor's exam	Staff explaining your placement in the wait to be treated	Impact of care on health and life	Staff listening carefully to your concerns
Specialists	Thoroughness of exam	Being involved in decisions	Listening carefully to your concerns	Impact of care on health and life
Lab Tests	Time to receive results	Time to schedule tests	Update on wait for results	Thoroughness of tests
Hospital Care (Personally Received)	Adequate information about condition and care	Courteous, compassionate staff	Consistent caregivers providing services	Contact is made for follow-up care
Surgical Services	Knowledge and competence of surgeon	Impact of surgery on health and life	Preparing you to manage recovery	Listening carefully to your concerns

Source: Health Services Utilization and Outcomes Commission, *Health Services Satisfaction: Survey of Albertans* (Calgary: Health Services Utilization and Outcomes Commission, 2003).

Even fewer take legal steps, although a recent Angus Reid poll found that 76% of Canadian adults believe that the threat of a lawsuit is important to ensuring that doctors act in the best interest of their patients. That said, Canadians are less apt to sue for medical malpractice than Americans. Over half (54%) favoured better doctor-patient communication to a lawsuit. In addition, about two-thirds of survey respondents (67%) believed that the threat of a lawsuit may lead to shortages of doctors in high-risk specialties, such as obstetrics, orthopaedics, and neurosurgery.⁸

The Canadian Medical Protective Association (CMPA) is a mutual defence organization that covers about 95% of doctors licensed to practice in Canada. Physician owned and operated, CMPA offers legal advice, legal counsel, and payment of legal fees, settlements, awards, and costs in legal actions.¹³ Membership fees vary substantially by medical specialty and region of the country, reflecting past and anticipated future claims experience and costs. Ontario physicians pay the highest fees; in some specialties, such as obstetrics, they pay as much as five times more than physicians in the rest of Canada. In some cases, provincial governments directly reimburse physicians for part of their fees.¹⁴

The Case of Baby M

Baby M was born a healthy girl in 1993, but her mother had the herpes simplex virus (HSV) 2. Within 10 days of her birth, baby M began showing symptoms of HSV. If she had been treated with the drug Acyclovir, the herpes would have been little more than an inconvenience to her and her mother. However, although she was under the care of a doctor who knew that her mother had the virus and although she presented with symptoms, baby M was not treated. She is now 10 years old and has severe neurological damage. After almost a decade of litigation, baby M was awarded close to \$2 million in damages. With proper treatment her disability could likely have been avoided entirely.⁹

Baby M's tragic story was judged to involve "medical negligence," a situation when a health care professional or institution fails to provide the expected standard of care and the improper treatment causes the patient to suffer an injury.^{10, 11} Tort law, in particular the area of negligence, governs the majority of actions brought against hospitals, doctors, and health professionals.^{10, 12} This law enables a patient who suffers harm when a health care provider and/or facility is negligent to be compensated.

How Do CMPA Fees Compare?

22

Membership fees vary by physician specialty and where the physician works or trains. According to the CMPA's 2004 fee schedule, physicians working in "high-risk" specialties, such as obstetrics or neurosurgery, pay higher fees. Due to higher numbers of claims and settlement awards, Ontario physicians also pay higher annual fees on average than those in other regions.

	Ontario	Quebec	Rest of Canada
Family Medicine*	\$2,592	\$1,190	\$1,572
Anaesthesia	\$9,768	\$2,878	\$3,912
Neurosurgery	\$50,508	\$15,499	\$21,996
Obstetrics**	\$87,972	\$17,815	\$26,808
Orthopaedic Surgery	\$29,028	\$10,438	\$13,140

Notes: *Excludes shifts in the Emergency Department, Anaesthesia, Surgery, and Obstetrics
**Obstetrics includes labour, delivery and/or surgery, with or without gynaecology.

Source: The Canadian Medical Protective Association, Fee Schedule for 2004 (Ottawa: Canadian Medical Protective Association, 2004).

The number of malpractice claims for physicians has fluctuated over time. The CMPA reported a seven-fold increase in the rate of claims between 1971 and 1987 (average growth rate of 6.4% per year).¹⁵ Since then, rates have stabilized, ranging from 1.7 to 2.5 claims per 100 physicians annually.^{13, 16, 17, 18} A number of factors may influence these trends, including changes in the legal process and insurance programs and the changing nature of medical practice.

Tracking Adverse Events Using Administrative Data

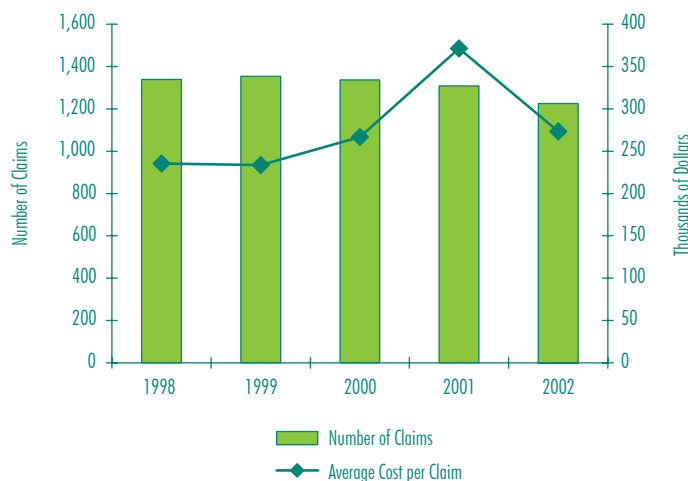
Large-scale national chart reviews provide rich information on patient safety, but they are expensive and time consuming to conduct and only capture a slice of adverse events, typically those related to hospital care. To support on-going quality improvement, systematic monitoring is required. Some special purpose mechanisms, such as systems to track problems related to medications, have been established, but there is also interest in using existing administrative data to track patient safety trends. (Hospitals, physicians, and other health care providers capture this summary data on the patients they serve and the care that they provide. It is used for various purposes, including funding health services and planning for future health needs.)

Ontario researchers used administrative data to track adverse events for hospital inpatients and day surgery cases between 1992–1993 and 1997–1998.²⁰ They looked at diagnosis codes specifically designed to identify misadventures during medical or surgical care, complications of care, and adverse drug reactions. These three groups of diagnoses were each recorded for less than 5% of hospitalizations. Adverse events were more common for patients admitted to hospital overnight than for those cared for in day surgery programs.

Claims Against Physicians

23

The average cost of negligence settlements and court awards varies, depending on the number of cases brought to completion in a given year, as well as the size of the cases. For example, a class action suit affecting a large group of patients can have a large impact on the average cost per case, as was the case in 2001. While there was a steady increase in costs for legal awards and settlements in the 1970s and early 1980s, the number of claims in the last five years has been fairly stable. The chart below shows both the average cost per claim and the number of legal actions filed.



Notes: A single class action settlement contributed to the large increase in average awards in 2001. When the value of this settlement is removed, the average cost per claim in 2001 was \$299,700.

View Data

Source: The Canadian Medical Protective Association, *The Canadian Medical Protective Association 2002 Annual Report* (Ottawa: CMPA, 2002).

Insuring Others Who Deliver Care

The Healthcare Insurance Reciprocal of Canada (HIROC) insures hospitals, nursing homes, community health centres, home care organizations, and other health care organizations in five provinces and one territory. In total, there are approximately 300 HIROC subscribers, representing more than 500 facilities and organizations. Other health care organizations typically use private insurance companies or a government plan, or are self-insured.¹⁹

More recently, Quebec researchers linked four administrative databases as part of an evaluation of the effects of a change in provincial drug plan policy. They found that seniors and welfare recipients used fewer “essential” drugs, experienced more serious adverse events (defined as the first acute care hospitalization, long-term care admission, or death), and had more visits to emergency departments after an increase in cost-sharing for prescription drugs in the mid-1990s.²³

Indicators of unplanned readmissions and unexpected complications of care have also been widely used. In 1995, for example, Manitoba researchers published information on hysterectomy readmissions.²⁴ Since 1999, Ontario hospitals have been monitoring readmissions and complications for several types of care as part of the province’s *Hospital Report* project. The latest series of reports also includes new indicators of outcomes that are sensitive to nursing care, such as pressure ulcers and urinary tract infections.

New Patient Safety Indicators

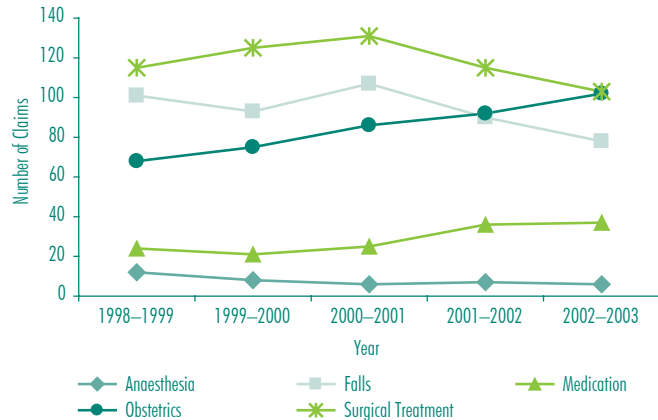
The full potential of administrative data has yet to be tapped. New patient safety indicators are being developed to flag potential adverse events. These indicators are like the warning lights on the dashboard of a car. They suggest areas for further investigation, rather than definitively confirming that a problem exists.

The Agency for Health Research and Quality in the U.S. (AHRQ) has identified 20 evidence-based patient safety indicators that can be calculated from administrative data.²⁵ Some are relevant at a facility level; others are most useful at a regional or national level. CIHI is in the process of adapting these and other patient safety indicators for use in Canada. Initial results for safety in the operating room are described on the next page.

Types of Hospital Claims

24

HIROC, a member-owned insurance organization, provides liability coverage for hospitals and various other not-for-profit health care organizations in five provinces and one territory in Canada. The types and frequency of insurance claims filed vary over time, as shown below. (The chart below includes all insurance claims reported to HIROC whether or not a legal claim was filed.)



Note: The types of allegations shown on this graph represent the five allegation groups that appear most frequently in the HIROC database. Data include both open and closed claims.

[View Data](#)

Source: Personal communication with Eleanor Morton, Vice President, Risk Management, Healthcare Insurance Reciprocal of Canada (HIROC), April 14, 2004.

What Difference Does the Weekend Make?

Often patients are discharged from hospital on a Friday. Researchers in Ontario wanted to find out if these patients had different outcomes than those discharged on other days. Their answer was yes. Patients discharged on Fridays were more likely to be readmitted or even die when compared to patients discharged on Wednesdays. The authors suggested that things like inadequate discharge preparation due to the volume of patients leaving, as well as the lack of weekend availability of home care services, may explain some of the increased risk.²¹

What about those admitted to hospital over the weekend? Again, researchers in Ontario looked at over 3.7 million acute care admissions from 1988 to 1997. They compared death rates among patients admitted on weekdays to those admitted on weekends, taking into account things like age, sex, and other existing conditions. They found that patients with some serious illnesses, such as ruptured abdominal aortic aneurysms, had a higher risk of dying if they were admitted on the weekend rather than during the week. The authors suggested that lower staffing levels, less experienced staff, and fewer supervisors on the weekends might explain some of the increased risk.²²

Data for Your Region

CIHI calculates rates of unplanned readmissions for health regions across the country using methods adapted from those developed for Ontario's *Hospital Report* project. See the companion *Health Indicators 2004* publication for updated readmissions information for the region where you live.

Safety in Operating Rooms

It sounds like an urban legend, but for a woman from Regina, it was a nightmare come true. Months after surgery, an airport metal detector alerted her to the fact that a surgical retractor had been left in her body.²⁶ Fortunately, this is a very rare event. Hospital procedures, in Regina and elsewhere, generally

i require operating room staff to count every piece of equipment used (e.g. gauze, sponges, and pads) after surgery. If the numbers don't add up, no sutures are made until the missing piece is found. Nevertheless, CIHI data suggest that there were 0.15 foreign objects left in after a procedure per 1,000 surgical and medical discharges between fiscal years 2000 and 2002.* Put another way, for every 6,667 procedures performed, one patient had a foreign object, such as a sponge or an instrument, accidentally left in her or his body.

A 2003 U.S. study looked at risk factors associated with the retention of foreign objects in surgical patients. They found that patients with retained foreign objects were more likely to have had emergency surgery (33% in cases compared to 7% in controls) or an unexpected change in surgical procedure (34% compared to 9%). They were also more likely to have a higher mean body-mass index. Surgical teams for patients with retained objects were less likely to have completed the standard counting procedure prior to suturing.²⁷

Bringing It All Together: A Summary of What We Know

In this chapter, we've touched on a few of the studies of adverse events in Canadian hospitals, but there are many more. Most focus on specific risks or locations. For example, a 2003 study compared the concentration of morphine infusions that were ordered to treat critically ill children to those in actual preparations. It found that two-thirds (65%) of infusions differed by more than 10% from the ordered concentration, a level outside industry standards.²⁸

* Rate does not include Quebec, Manitoba, and Nunavut due to differences in how data are collected.

We do not have the space to discuss each study in detail, but it is clear that the number of people exposed to a given risk varies greatly. So does how often different types of adverse events occur. The latest estimates of adverse event rates in some areas of health care, such as preventing the transmission of HIV through blood transfusions, are very low compared to the probability of other events, such as medication errors.

How Often Do Adverse Events Happen?

25

Most Canadians access health services each year and receive good quality care. Rates of different types of adverse events, some preventable and others not, vary significantly. The chart below shows the average number of people who receive care or are exposed to a risk per adverse event for selected events where national estimates are available. A higher number suggests safer care.

Type of Event	Average Number Exposed per Event
Adults with health problems who report being given the wrong medication or the wrong dose by a doctor, hospital, or pharmacist in the past two years**	9
Adults contracting a nosocomial infection while in acute care hospital****	9
Children contracting a nosocomial infection while in acute care hospital****	11
Medical/surgical patients experiencing an adverse event for patients in acute care hospitals*	13
Reporting an adverse event in the past year for oneself or a family member***	16
Third/fourth degree tears during childbirth§	20
Birth trauma§	81
Deaths associated with preventable adverse events for medical/surgical patients in acute care hospitals*	152
Adverse transfusion reactions§	299
In-hospital hip fractures for adults 65 and older§	1,124
Foreign object left in after procedure§	6,667
Blood-transfusion transmitted infections: hepatitis B ^a	72,046
Blood-transfusion transmitted infections: hepatitis C ^a	2,857,143
Blood-transfusion transmitted infections: HIV ^a	10,000,000

Notes:

* G. R. Baker et al, "The Incidence of Adverse Events in Canadian Hospitals", *Canadian Medical Association Journal* (2004): in press.

** From: R. J. Blendon, C. Schoen, C. DesRoches, R. Osborn, K. Zapert, "Common Concerns Amid Diverse Systems: Health Care Experiences in Five Countries," *Health Affairs* 22, 3 (2003): pp.106–121.

*** Canadian Institute for Health Information (survey conducted by The Berger Population Health Monitor), (Toronto: CIHI, 2004); includes adults 15 years of age and older.

****From Canadian Nosocomial Infection Surveillance Program and the Canadian Hospital Epidemiology Committee of Health Canada

§ Discharge Abstract Database, CIHI

^a From: J. A. Chiavetta, M. Escobar, A. Newman, Y. He, P. Driezen, S. Deeks, D. Hone, S. O'Brien, G. Sher, "Incidence and Estimated Rates of Residual Risk for HIV, Hepatitis C, Hepatitis B and Human T-cell Lymphotropic Viruses in Blood Donors in Canada, 1990–2000," *Canadian Medical Association Journal* 169, 8 (2003): pp. 767–773. Estimates based on units of donated blood. Excludes Quebec.

Note: The charts above are based on point estimates of adverse event rates. See the original reference for more information on confidence intervals around these estimates.

Source: Compiled by CIHI.

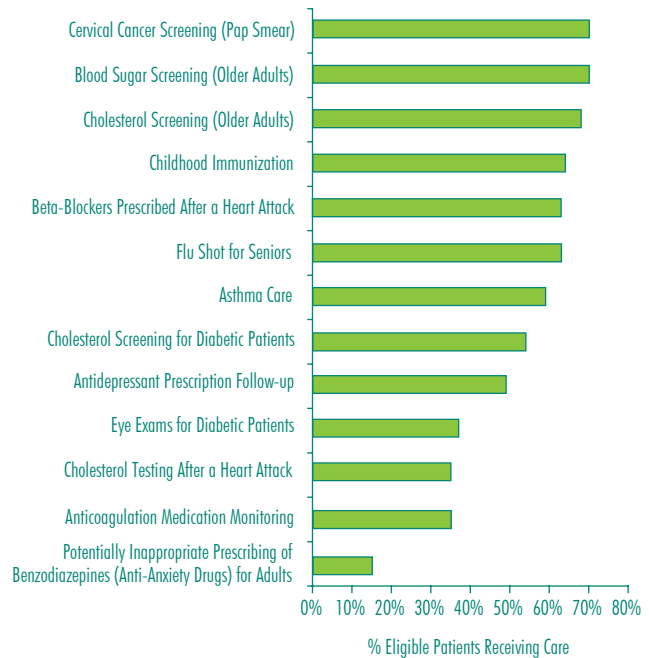
Beyond Adverse Events—Underuse, Overuse, Misuse

There's much more to ensuring quality care than preventing adverse events. Experts suggest that *underuse* of care that has been shown to be beneficial could affect even more people each year. For example, less than half of women (47%) aged 15 to 55 who gave birth in the past five years in 2000–2001 reported taking folic acid before their last pregnancy.²⁹ *Overuse*, when a health care service is provided under circumstances in which the potential harm exceeds the likely benefit, can be equally problematic. Taking antibiotics for a cold is a classic example of overuse.

Missed Opportunities?

26

Manitoba researchers recently used administrative data to look at what proportion of eligible patients received 13 types of care. Across the province, results were better for some types of care, such as childhood immunizations, than others, such as diabetics having eye exams. In some cases, results varied between Winnipeg, Brandon, and non-urban parts of the province. The chart below shows results for Winnipeg. (For details on relevant age groups, inclusion and exclusion criteria, and other methods, please see the paper mentioned below.)



View Data Source: A. Katz, C. De Coster, B. Bogdanovic, R. A. Soodeen, D. Chateau, *Using Administrative Data to Develop Indicators of Quality in Family Practice* (Winnipeg: Manitoba Centre for Health Policy, 2004).

Information Gaps: Some Examples

What We Know

- How many people suffered adverse events in Canadian hospitals in 2000–2001, what proportion of these events experts considered preventable, and the most common types of events.
- How many Canadians said in 2003 that they or a family member had ever experienced a preventable adverse event and the percent who felt that the most recent event resulted in severe consequences.
- How many medical malpractice claims are settled each year and the average award size.
- How often complications of medical or surgical care are recorded as the underlying cause of death on death certificates.
- How many Canadians experience specific types of adverse events in hospital, such as having a foreign object (e.g. a sponge or instrument) left in during a procedure.
- Pockets of information, typically from research studies, on other types of adverse events inside and outside of hospital.

What We Don't Know

- How many Canadians experience adverse events or near misses each year, inside and outside hospitals? How does the rate of adverse events vary across the country? Is it changing over time?
- What is the annual human and economic toll of adverse events in health care?
- What are the most effective strategies to prevent adverse events? To what extent are these strategies being employed across the country? What are the key enablers in areas that have taken action and the key barriers in areas that have not?
- How do some of these patient safety indicators vary from one region to another and what are their trends over time?

What's Happening

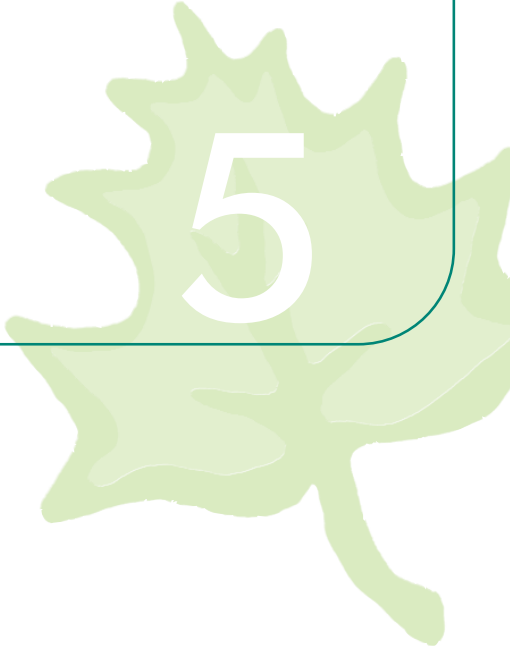
- Data to estimate rates of adverse events in Quebec and Ontario hospitals are being collected using the same methods as the national study. This involves capturing data from an additional 16 hospitals in Quebec (100 charts per hospital) and seven hospitals in Ontario (230 charts per hospital).
- In February 2003, Canada's premiers and the Prime Minister agreed that implementation of a national strategy for improving patient safety was critical. They asked health ministers to explore opportunities for working with the Canadian Patient Safety Institute to achieve comparable reporting on medical errors and adverse events.
- CIHI is adapting patient safety indicators based on administrative data developed by the Agency for Health Research and Quality in the U.S. (and others) for use in Canada. The first indicators are included in this year's report. Additional indicators will follow in subsequent years, both at a regional level and provincial level.
- CIHI has also commissioned a two-part survey of the public's experience with and knowledge of patient safety. The first was conducted prior to the release of the national study on adverse events in Canadian hospitals; the second will be undertaken after the release.
- A number of research studies related to patient safety are underway across the country. For example, the research team that conducted the national study on adverse events in hospitals is reviewing how such events could be monitored on an on-going basis using existing sources of data.

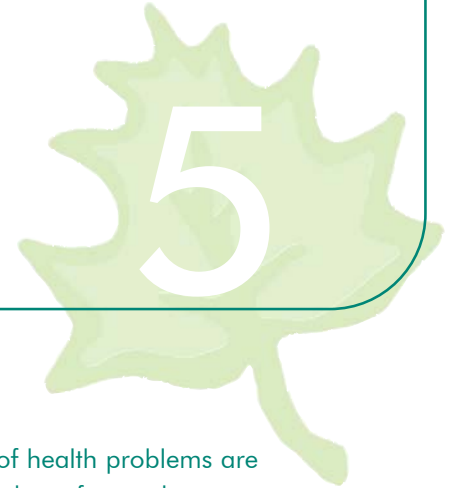
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Preventing the Preventable





Preventing the Preventable

“The only foolproof way to eliminate medical errors is to eliminate disease.”¹

Medical advances eradicated smallpox, but most types of health problems are here to stay. For those affected, the challenge is to deliver the safest and most effective care possible.

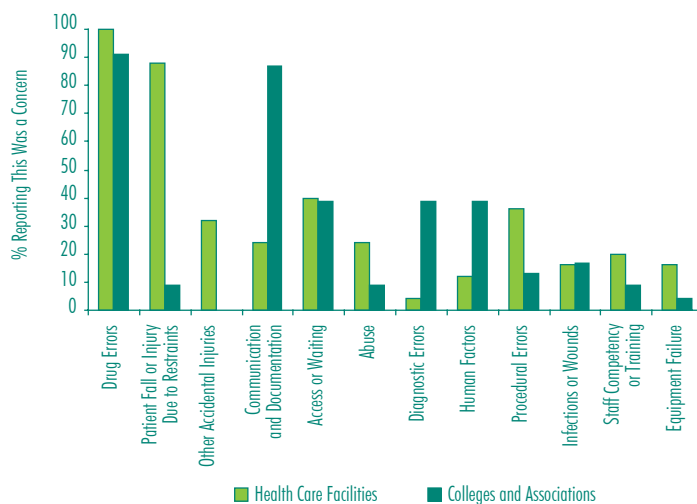
Improving patient safety depends on broad, crosscutting approaches (as discussed in Chapter 2), as well as narrower initiatives targeting particular issues. In this chapter, we focus on three specific areas: medication errors, falls in care facilities, and nosocomial infections. In each case, we look at what we know about the

prevalence of adverse events, who is most at risk, and prevention strategies.

What Are the Main Patient Safety Concerns? 27

In a 2002 survey, researchers asked Canadian health care organizations and professional colleges/associations about the patient safety issues they, or their members, face. One-third (33%) responded. Some issues—such as drug errors—were concerns for almost all organizations. The frequency with which others were reported varied considerably.

The organizations were also asked about obstacles to identifying and reporting errors. A culture of fear of reprisals and blame was identified as an issue by 72% of the health care facilities and 48% of colleges/associations. Colleges/associations most frequently cited legal issues (63%), such as legislation and regulations, as an obstacle.



Note: Percentages may add up to more than 100%, because respondents could give more than one answer.

Sources: G. R. Baker, P. Norton, *Patient Safety and Healthcare Error in the Canadian Healthcare System. A Systematic Review and Analysis of Leading Practices in Canada with Reference to Key Initiatives Elsewhere. A Report to Health Canada* (Ottawa: Health Canada, 2002) [on-line], from <www.hc-sc.gc.ca/English/care/report/index.html>.

[View Data](#)

Medication Errors

In April 1992, a four-year old girl from Nova Scotia had her last chemotherapy treatment.² Diagnosed two years earlier, doctors considered her cured of leukemia. Due to a variety of factors, the chemotherapy drug Vincristine was mistakenly injected into a spinal catheter instead of intravenously. Tragically, she died—and she was not alone. Before and after her death, others died in similar circumstances, both in Canada and elsewhere.

A **medication error** is “the failure to complete a planned action as it was intended, or when an incorrect plan is used, at any point in the process of providing medications to patients.”³ For example, patients can receive the wrong drug or an incorrect dose; they can take the right drug improperly; or interactions between two or more drugs could cause adverse effects. (Medication errors are distinct from side effects, which may occur even when medications are appropriately prescribed and used.)

Prevalence and Consequences

While there are no comprehensive national estimates of the frequency of medication errors, pockets of information suggest that they are one of the most common types of adverse events in health care. In the recent national study of adverse events in Canadian hospitals, drug- and fluid-related events accounted for almost one in four (24%) events identified, second only to those related to surgery.⁴ Other studies show that medication errors are not confined to hospital settings. For example, a review of 502 patient charts at an Ottawa hospital identified 64 patients with adverse events (13%).⁵ Of the 39 who experienced an event prior to being hospitalized, 20 occurred in ambulatory care. The vast majority of these (90%) were drug related.

Experience in Canada and elsewhere suggests that particular population groups, such as children, are at higher risk for drug errors. Factors that may make ordering, dispensing, administering, and monitoring medications especially complex for children include:

- The need to make additional calculations and/or dilutions of medications based on weight-based dosing;^{6,7}
- The difficulty young children may have in communicating adverse effects they experience; and
- The fact that children tend to be more sensitive than adults to small dosage errors.⁶

Researchers in 2001 found that dosing errors (28%) were the single largest contributor to drug errors for children admitted to hospital (e.g. in neonatal ICUs, paediatric ICUs, and medical/surgical wards).⁶

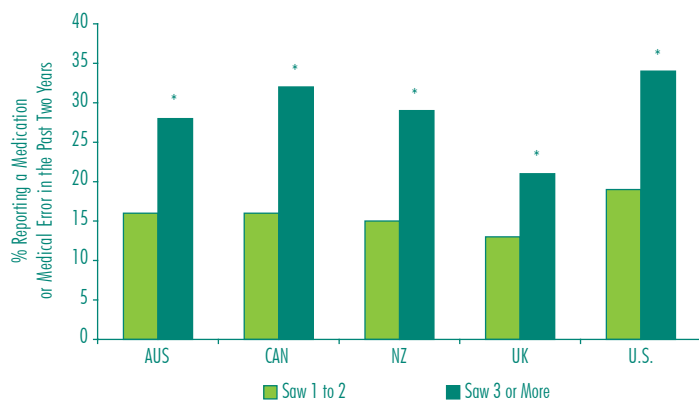
Seniors may also be at increased risk. The United States Pharmacopeia⁸ recently found that more than a third of reported hospital drug errors involved persons aged 65 and older. In part, this may be because they are more likely to take multiple medications. Seniors represent about 12% of the Canadian population, but they take almost 33% of prescribed drugs.⁹

Seniors may also be more susceptible to drug errors because they are likely to have more than one prescribing physician and to use more than one pharmacy.¹⁰ In 2002, the Commonwealth Fund surveyed “sicker” adults in five countries: 11% of Canadian respondents said that a doctor, hospital, or pharmacy had given them the wrong medication or dose in the past two years. The survey found that the more doctors *patients* saw and prescriptions they had, the more likely they were to report having experienced drug errors and medical mistakes.¹¹ Across all countries, sicker adults who saw three or more doctors reported experiencing drug errors and medical mistakes more frequently than those who saw fewer physicians.

Increasing Risk?

28

Among adults with health problems, a 2002 international survey found that respondents who saw three or more doctors were significantly more likely to report having had a medical or medication error than patients who saw only one or two doctors. This may be because patients who are under the care of several doctors probably tend to have complex health problems, potentially elevating their risk of adverse events.



Note: *Statistically significant difference from 1 or 2 doctors at p.<05

View Data Sources: R. J. Blendon, C. Schoen, C. DesRoches, R. Osborn, K. Zapert, “Common Concerns Amid Diverse Systems: Health Care Experiences in Five Countries,” *Health Affairs* 22, 3 (2003): pp.106–121.

Preventing and Reducing Drug Errors

Five years after the death in Nova Scotia, another child died at B.C. Children's Hospital. The hospital's review of the case found that:

There have been at least three other child deaths in this country since 1989 as a result of Vincristine being injected in error into the spinal fluid. These occurred in Nova Scotia, Quebec and Ontario. Each was fully investigated in the institution where it occurred, both internally and by provincial coroners. Yet we found that the details of these errors have not been comprehensively shared between provinces, between coroners' offices, or between hospitals. We were not able to learn from our mistakes, nor did we have the opportunity to learn from those of our colleagues.¹²

The hospital decided to share their experiences broadly, in the hopes that further deaths would be prevented. As discussed in Chapter 2, many experts advocate a more open culture of information sharing, including improved reporting of medication incidents, as one step in improving patient safety.¹³

Other strategies, from regulation to physical safeguards, are also in place or proposed. When researchers asked a panel of physicians to identify the main themes related to drug-related morbidity in older Canadians, they listed factors involving the patient, physician, health care system, and cultural environment. The study also identified strategies from the literature that providers could use to reduce or prevent drug-related morbidity, including:

- Involvement of patients in their own care;
- Strategies related to the product (e.g. safe, accessible, cost-effective medicines) and the system (e.g. performance evaluation and improvement);
- Appropriate practices by physicians (e.g. timely recognition of need, prescribing for clear objectives) and for pharmacists (e.g. dispensing with appropriate advice); and
- Clear communication.¹⁴

Approaches to improving medication safety range from the costly to almost cost-less.

They include initiatives that require sustained national (or even international) action, and ones that can be implemented on a very local scale. In addition, some have been rigorously evaluated; the potential of others remains to be tested.

To cover all the possibilities would require a separate report. Instead, we chose to focus on four that illustrate the range of possibilities, although they are not the only, or even perhaps the most important, approaches that could be taken.

Providing Safe Care in the Community

The Victorian Order of Nurses (VON) is a non-profit, national health organization that provides a range of health care services to people in their communities. The VON has implemented two innovative programs to promote client safety in the community: the Scannable Incident Report (SIR), and the Vial of Life™ program in collaboration with Shoppers Drug Mart.

The SIR, which has been in place for two years, is a standardized, electronic form used for incidence reporting across the VON. The purpose is to help identify the lessons learned from previous incidents and to facilitate quality improvement throughout the organization. The report captures information about incidents related to client and worker safety using five categories: medication, intravenous and blood treatments, procedural problems, client complaints, and safety or security issues.

The Vial of Life™ program is offered free of charge to all customers of Shoppers Drug Mart in Ontario. The aim is to make patient information easily accessible in one centralized location—the refrigerator. This saves fire fighters and paramedics on the scene of an emergency from spending time searching for basic medical and prescription information. Participants enter their personal medical and prescription information (which includes medical, demographic, and physician contact information) in a vial that is placed in the refrigerator.¹⁵ A magnet is placed on the outside of the refrigerator to alert emergency personnel that a vial can be found inside.

For more information, see www.von.ca.

Changing Regulations

Medication safety is a concern for health care providers and the public.¹⁶ Health Canada has long regulated pharmaceutical products and is beginning to do the same for natural health products (NHPs). Sometimes called complementary medicines, NHPs include traditional and homeopathic medicines, vitamins and minerals, herbal remedies, probiotics, amino acids, plant isolates, and essential fatty acids.

In 2002, about 70% of Canadians reported that they regularly took some type of natural health product, according to surveys conducted for Health Canada.¹⁷ Agencies such as the Canadian Task Force on Preventive Health Care recommend the use of some of these products (e.g. folic acid) to promote health and help prevent disease. However, use of NHPs is not always risk-free. Possible side effects or risks associated with NHPs may include overdose or bad interaction with prescription, over-the-counter drugs, or other herbal remedies; allergic reactions; self-diagnosing and medicating for a serious condition; and others.¹⁸

Health Canada recently introduced a new regulatory framework for NHPs sold over-the-counter.¹⁹ The regulations took effect on January 1, 2004 and will roll out over the next two to six years. They cover definitions, product and site licensing, good manufacturing practices, labelling and packaging requirements, and adverse reaction reporting. Health Canada is also responsible for assessing the safety and effectiveness of NHPs, using criteria defining the amount and type of evidence required to support health claims being made.²⁰

Expanding the Team

Different members of the care team bring different skills, knowledge, and approaches to patient care. A number of studies have explored the effect of including hospital-based pharmacists in decisions about prescribing and in monitoring medications. A systematic review of literature published between 1966 and 1999 by the Cochrane Collaboration suggested that expanding pharmacists' roles can be beneficial to patients and physicians alike.²¹ Since then, further studies have been completed. For example, a 2003 U.S. study²² found that when pharmacists participated in medical rounds in hospital, drug errors fell by as much as 78%.

Making the Most of e-Health

Imagine trying to keep track of the thousands of drugs that have been approved for use in Canada. Then add to that the growing, sometimes-changing, literature regarding indications, side effects, and potential interactions. It has been estimated that almost half of serious medication errors occur because clinicians don't have enough information about their patient and/or the drugs they are prescribing.²⁴

Put it all together and it's not surprising that organizations around the world are looking for technological solutions to help reduce medication errors. (And that's not even taking into account the well-known challenges of illegible handwriting on prescription forms and the potential for calculation errors and errors in transcription.)

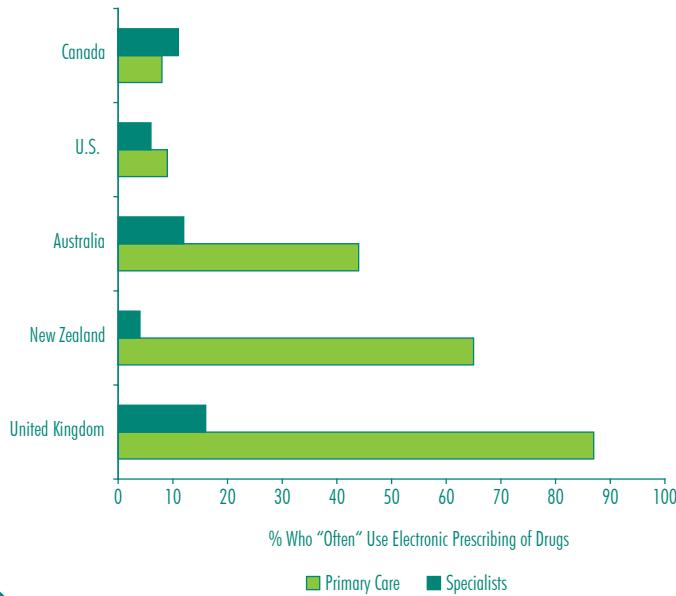
Managing Warfarin in Five Hills, Saskatchewan

Classified as a "high-alert" medication by the Institute for Safe Medication Practices, Warfarin is a blood-thinner. In 1999, the Five Hills Health Region in Saskatchewan decided that pharmacists, not doctors, would monitor patients' laboratory test results and adjust dosages of this drug. An evaluation found that fewer patients showed up in the emergency room with adverse effects related to this medication, particularly bleeding and bruising, after the change was made.²³

Prescribing Drugs On-Line

29

In a 2000 survey, less than one in 10 primary care physicians in Canada reported “often” prescribing drugs electronically, about the same level as in the U.S. but significantly less than in Australia, New Zealand, and the UK.



View Data Source: Commonwealth Fund 2000 International Health Policy Survey.

Did You Know?

In 2001–2002, 15% of Ontario acute care teaching/ community hospitals reported that an electronic system was the primary source of information about medications, up from 13% in 2000–2001.²⁵

Information technology is not a panacea, but research suggests that it offers promise in some areas.^{26–28} The electronic health record enables access to pertinent patient information such as records of prescriptions and allergies, laboratory test results, and more.²⁹ Computerized physician order entry systems automate the medication ordering process and can help to ensure standardized, legible, and complete orders. In addition, clinical decision support systems, which are often built into order entry systems, can facilitate tasks such as drug selection, dosage, and duration calculations.^{26, 30}

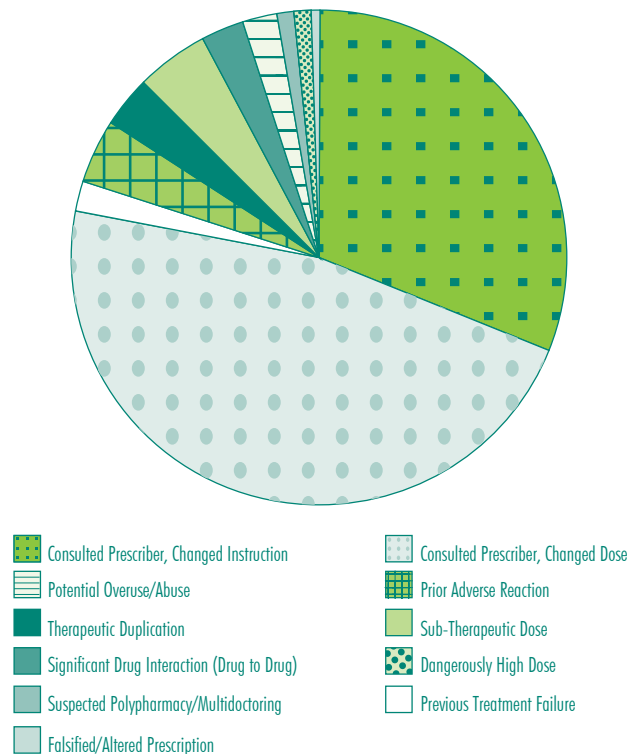
Catching Potential Problems on the West Coast

In B.C., authorized care providers can check for potential drug interactions, allergies, and other problems using the province-wide PharmaNet system. In 2003, the system captured 35.3 million prescriptions and flagged more than 7.9 million potential interactions.³¹ About 12% were classified as “most significant,” generally requiring action to reduce the risk of a serious adverse interaction. Most cases (82%), however, were in a “moderate” category, indicating that pharmacists should assess patient risk and take action as needed. The other 6% were deemed “possibly significant.”

Not all situations require intervention, but B.C. pharmacists may choose not to dispense prescriptions as originally written. In some cases, when this results in a cost saving for the province’s PharmaCare plan, pharmacists can claim a fee for their professional intervention. Chart 30 shows the distribution of such claims for special services in 2003.³²

PharmaNet Special Services Claims

30



View Data Source: Quarterly PharmaNet Stats Comparison, B.C. Ministry of Health Services.

Five studies reviewed by U.S. researchers showed that medication ordering improved and that drug errors decreased with the use of computer-based systems.²⁶ Closer to home, Quebec researchers studied prescriptions for 12,560 older patients. They found that the rate of potentially inappropriate prescriptions per 1,000 visits issued by primary care physicians was 18% lower when computerized decision-making support was used.¹⁰

Similarly, a 2003 systematic review of the literature found 15 (mostly small) studies that explored the effect of computer systems that provide advice to hospital staff on optimal drug dosages.²¹ The results suggest that e-prescribing systems that provide computer support for drug dosage have many benefits, including reducing toxic drug levels, adverse reactions, and length of hospital stay. At the same time, there was a tendency for computer support to result in higher drug dosages.

Reducing Confusion Between Medications

Look-alike (labelling), sound-alike (name confusion) medications have been identified as a significant contributor to medication adverse events.³³ Health Canada completed an issues analysis on this topic in 2003. The report recommended a combination of pre-market and post-market strategies to address the issue.³⁴

A related concern is the use of potentially confusing abbreviations, symbols, and dose designations. To help health professionals avoid error-prone prescribing, the Institute for Safe Medication Practices has compiled an updated list at www.ismp.org/PDF/ErrorProne.pdf. Both they and others also publish lists of similar drug names to alert providers and patients to those that may cause confusion.

The Spread of Infection

It used to be fairly common for patients to survive surgery, only to die later from infections. More than a century ago, Sir Thomas Roddick introduced an antiseptic system to Montréal hospitals, reducing this risk for his patients.³⁸ Much has changed since 1877, but last year's SARS outbreak was a vivid reminder that infectious diseases can still spread in health care environments.

Research suggests that the risk of acquiring nosocomial (health care-associated) infections is related to a number of factors, including patients' overall health status and the diagnostic or therapeutic interventions they receive.³⁹ For example, older patients and those with underlying diseases tend to be more susceptible to infection. Intensive care, surgical, and orthopaedic units also tend to have higher infection rates, perhaps because of the severity of their patients' illnesses and the types of treatments they receive.

Simple Ideas

Improving medication safety can be as simple as changing the way that prescriptions are written. Two drugs with similar names are prednisone and prednisolone. Using so called "tall man" lettering, they would be written as predni**S**ONE and predni**S**OLONE. The U.S. Food and Drug Administration has suggested that writing drug names this way may reduce mix-ups between the medications involved.³⁵ Other suggestions for reducing these types of problems include writing the generic and brand name on the prescription, listing the indication for the drug, and asking for a read-back of verbal medication orders.³⁶

Removing the Hazards

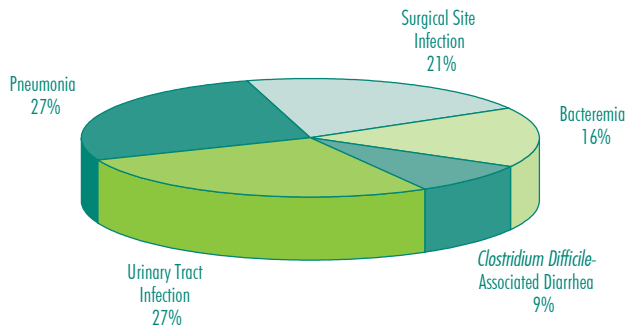
Used correctly, potassium chloride can help patients. But concentrated solutions can kill. Medication safety advocates recommend storing such solutions in pharmacies to provide a physical barrier, in hopes of reducing the chance that they will be administered inadvertently. (Nevertheless, as recent events in Calgary remind us, this approach does not entirely eliminate the potential for problems.)

The Institute for Safe Medication Practices Canada chose to tackle this issue in 2002. At the beginning of the project, 62% of hospitals who answered an ISMP Canada survey said that they stored concentrated potassium chloride in patient care areas. Preliminary results from the follow-up survey (conducted eight months later) indicated that this number had dropped to 26%. In addition, 71% of respondents said that they had made changes to the storage, availability, and/or usage of the solution in their hospital.³⁷

Common Hospital-Acquired Infections

31

In 2002, researchers conducted a point prevalence survey of nosocomial infections among 6,745 patients in 29 acute care hospitals across nine provinces. Five types of infections were surveyed. Urinary tract infections and pneumonia were most common, accounting for 27% of all selected infections, according to preliminary survey results.



Note: Hospitals from P.E.I. and the territories are not represented. Patients from long-term care and rehabilitation wards, psychiatric wards, maternity and well-baby nurseries, and day or overnight surgeries were also not included.

Source: Unpublished data from D. Gravel, the Point Prevalence Working Group, the Canadian Nosocomial Infection Surveillance System, the Canadian Hospital Epidemiology Committee, Point Prevalence Survey of Nosocomial Infections Within Selected Canadian Health Care Institutions (2004).

[View Data](#)

Prevalence and Consequences

Some suggest that nosocomial infections are the second most common type of adverse event in hospitalized patients, after medication errors.⁴⁰ In the U.S., an estimated two million nosocomial infections are reported annually, resulting in about 90,000 deaths.⁴¹ A recent meta-analysis of international literature estimated that at least 20% of nosocomial infections are probably preventable using current knowledge.⁴²

In 2002, researchers from the Canadian Nosocomial Infection Surveillance Program and the Canadian Hospital Epidemiology Committee of Health Canada conducted two point prevalence studies for adult and paediatric patients of selected nosocomial infections in 29 acute care hospitals.^{43, 44} Preliminary results from the study⁴³ estimated 110 nosocomial infections per 1,000 adult patients. Overall, the most common type was urinary tract infections, followed by pneumonia, surgical site infections, bacteremia, and *Clostridium difficile*-associated diarrhea. Adult patients in an intensive care unit were more likely to have an infection than surgical and medical patients. At 89 per 1,000 patients, infection rates were lower for children.⁴⁴ Infections were more common in infants than in older children.

Tracking Infections in Ontario

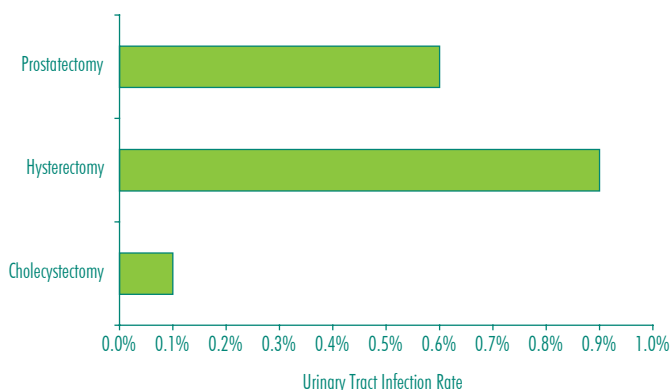
Ontario's Hospital Report series is a balanced scorecard that includes a variety of indicators. The 2003 report showed that, overall, less than 4% of patients in acute care hospitals acquire pneumonia or urinary tract infection (UTI) after admission.²⁵ Rates do, however, vary by patient group. Among patients with selected

surgical procedures, for example, UTI rates were higher following hysterectomy (0.9%) and prostatectomy (0.6%) procedures than cholecystectomy (0.1%). Researchers suggest that this variation may partly reflect differences in the use of indwelling catheters following surgery.

Furthermore, rates of hospital-acquired pneumonia are higher for medical patients, including those with strokes and heart attacks, than for surgical patients. The report suggests that this may partly be explained by these patients' decreased mobility and longer hospital stays.

Urinary Tract Infections in Ontario

32



[View Data](#)

Source: Canadian Institute for Health Information, "Hospital Report 2003: Acute Care" (Ottawa: CIHI, 2004).

Preventing and Reducing Infections

Infection control, like other challenges in patient safety, is a complex problem with multi-dimensional solutions. Health care providers have a number of tools at their disposal. Options vary in their complexity, cost, evidence-base, effectiveness, and other characteristics.

In 2000, researchers reviewed infection control resources and activities in Canadian acute care hospitals⁴⁵ following a model developed in the U.S.⁴⁶ They found strengths in some areas, but also identified gaps in resources, surveillance, and infection control activities. Findings include:

- Although all participating hospitals had infection control practitioners, 42% of hospitals did not meet the U.S. study’s recommendation of a minimum of one per 250 beds (the Canadian Infection Control Alliance recommends a minimum of one practitioner per 175 beds; 80% of hospitals did not meet this recommendation);
- 87% of hospitals had a surveillance index score of less than 80, meaning that they were putting less than 80% of surveillance recommendations into practice; and
- 90% of hospitals had an infection control index score of less than 80, meaning that they were putting less than 80% of infection control recommendations into practice.

Did You Know?

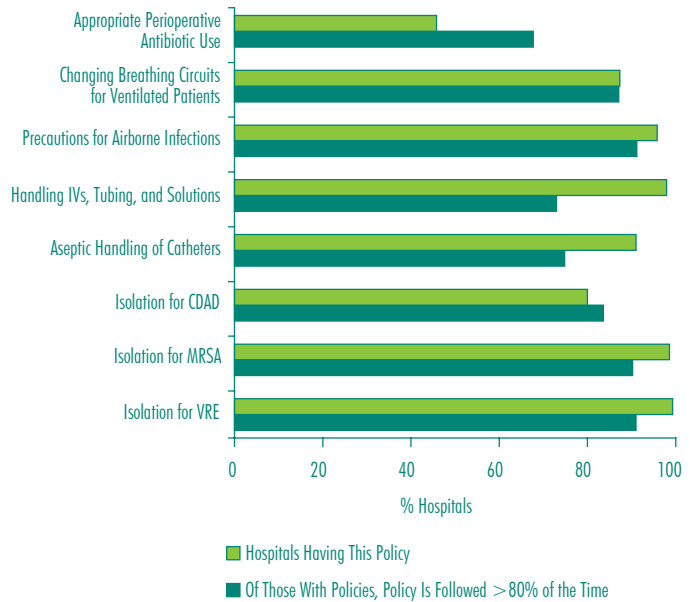
Hundreds of studies have linked working conditions and worker satisfaction to productivity, quality, and worker health and safety in many industries. New research is beginning to untangle the relationships in health care. For example, various researchers have examined the relationship between staffing levels, hours of work, adverse events, outcomes of care (e.g. urinary tract infection and pneumonia rates), and the well-being of health care providers.

Results vary somewhat from study to study. A recent review of the literature sponsored by the Institute for Medicine in the U.S. found that “there was sufficient evidence to conclude that several different specific working conditions affect outcomes that are related to patient safety. There was also sufficient evidence to conclude that some working conditions affect rates of medical errors.”⁴⁷ For example, studies have documented a relationship between some quality of care measures (e.g. urinary tract infection and pneumonia rates) and nursing staff levels and/or mix. Research has also linked care providers’ emotional exhaustion, job satisfaction, and fatigue to measures of quality of care in some, but not all cases. Understanding potential relationships between patient safety and these and other working conditions is an active area of research.^{48–53}

Policies—How Well Are They Followed?

33

Hospitals establish infection control policies in order to prevent cross-transmission and reduce infection rates. These range from isolation policies for patients infected with transmissible diseases to policies for aseptic handling of devices and appropriate use of antibiotics. The following chart shows the percent of selected Canadian hospitals that reported having various infection control policies in place, as well as the percent of these hospitals that reported that their policies were adhered to at least 80% of the time.



Note: CDAD = Clostridium difficile-associated diarrhea
 MRSA = Methicillin-resistant Staphylococcus aureus
 VRE = Vancomycin-resistant enterococci

Source: D. E. Zoutman, B. D. Ford, E. Bryce, M. Gourdeau, G. Hébert, E. Henderson, S. Paton, “The State of Infection Surveillance and Control in Canadian Acute Care Hospitals,” *American Journal of Infection Control* 31 (2003): pp. 266-273.

View Data

Strategies to Improve Hand Hygiene Compliance 34

Barriers	Strategies
Lack of Knowledge	<ul style="list-style-type: none"> Educate staff on importance of hand hygiene Provide staff with hospital infection rates
Lack of Motivation	<ul style="list-style-type: none"> Observe staff practices and give regular feedback Have senior staff act as role models
Availability of Hand-Washing Facilities	<ul style="list-style-type: none"> Provide accessible and conveniently located hand-washing facilities Distribute waterless antiseptics in wall-mounted dispensers or have staff carry them in containers
Hand-Washing Product	<ul style="list-style-type: none"> Supply staff with acceptable hand-washing products that are appropriate in cost
Skin Irritation	<ul style="list-style-type: none"> Supply staff with skin lotions that are compatible with antiseptic products

Source: Health Canada, *Infection Control Guidelines: Hand Washing, Cleaning, Disinfection, and Sterilization in Health Care* (Ottawa: Health Canada, 1998) [on-line], from <<http://www.hc-sc.gc.ca/hpb/lcdc/publicat/ccdr/98pdf/cdr24s8e.pdf>>.

Washing Our Hands of Infection

Hand hygiene is generally considered the single most important specific method for infection control.⁵⁴ Health Canada provides specific hand hygiene recommendations for people working in health care. Average baseline compliance rates, however, are usually estimated at below 50%.^{55, 56} They tend to vary between hospital wards, professional categories, and work conditions. For example, a study in Montréal found that nurses were more likely to comply with hand-washing precautions related to methicillin-resistant *Staphylococcus aureus* than physicians, orderlies, visitors, and housekeeping personnel.⁵⁷ However, they were less likely to do so than occupational and physical therapists.

In 1998, Health Canada identified five main obstacles to hand hygiene compliance, as well as strategies to address these barriers.⁵⁴ According to this report, a successful hand hygiene promotion campaign requires a multidimensional approach that addresses logistical barriers and behavioural issues of poor compliance.

Reducing Infection Rates in Switzerland

In the mid-1990s, a Swiss teaching hospital implemented a three-year hand hygiene promotion campaign that consisted of two main components:⁵⁸

- Teams of health care workers (HCWs) across all wards created posters that featured various hand hygiene messages, as well as the name of the ward that proposed the message, so that HCWs would have a sense of ownership of the campaign.
- Bottles of alcohol-based hand rubs containing skin emollients were mounted on all beds to facilitate access; they were also provided in new flat bottles designed to be easy to carry in pockets.

An evaluation of the campaign found that adherence rates improved from 48% in 1994 to 66% in 1997. The prevalence of nosocomial infections also decreased from 17% (1994) to 10% (1997) of patients.

Fractures While in Care

Falls are one of the leading causes of serious injury. They account for almost 30% of all injury hospitalizations and about a third of in-hospital deaths among people admitted for injuries.⁵⁹

Most falls occur in the community, but health care facilities identify preventing falls within their walls as an important patient safety challenge. Overall, across the country⁸ between 2000–2001 and 2002–2003, about 0.9 people aged 65 and over per 1,000 surgical and medical hospitalizations broke a hip after admission. Put another way, one inpatient sustained a hip fracture for every 1,124 surgical and medical hospitalizations among seniors.

§ Excludes data from Quebec, Manitoba, and Nunavut.

Understanding the In-Hospital Hip Fracture Indicator

The calculations for this indicator are based on methods originally developed by the Agency for Healthcare Research and Quality in the U.S. Detailed descriptions of our methods and technical notes are available on the CIHI Web site (www.cihi.ca).

- These data are from CIHI's Discharge Abstract Database; data for Quebec, Manitoba, and Nunavut are not included.
- Data were pooled over a three-year period: April 1, 2000 to March 31, 2003.
- Results are based on where patients live, not where they were treated.
- Includes men and women 65 years of age and older who were in an acute care hospital (inpatient surgical and medical discharges).
- Rates are risk-adjusted for type of inpatient care (medical vs. surgical), age, and a range of comorbid conditions (e.g. seizure, stroke, delirium, and others).

Likewise, between 1997–1998 and 2002–2003, about 4% to 5% of longer-term patients in complex continuing care settings in Ontario had a fall recorded on their quarterly assessment. (Although complex continuing care residents are primarily elderly, they differ from residents typically found in nursing homes and homes for the aged in that they tend to be more functionally impaired and clinically complex.⁶⁰) The younger the resident, the less likely they were to have fallen. However, previous falls were a strong predictor of future falls. Residents were at least five times more likely to have fallen in the last 30 days, if they had experienced a fall in the previous 31 to 180 days.

Men were more likely to fall, but less likely to experience a fracture. Fall rates for men were up to two times higher than for women. Experts suggest that osteoporosis, a risk factor for fractures, may partly explain the difference. Women are more likely to have osteoporosis than men. The Osteoporosis Society of Canada estimates that one in four women over the age of 50 has osteoporosis, compared to one in eight men.⁶¹ The prevalence has been reported to be as high as 85% to 95% in female residents in long-term care, aged 85 years and older.⁶²

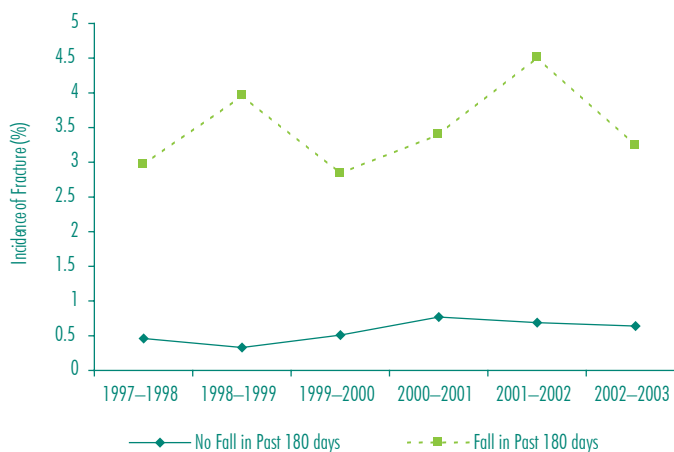
A wide range of strategies has been proposed to reduce the risk of falls and resulting injuries in care facilities. Hamilton researchers reviewed the literature on how to prevent falls in older adults.⁶³ For institutional settings, they found that there was evidence to suggest that falls-related programs of safety checks, staff education, and monitoring can be effective. Based on their review, they also recommended assessing residents who have fallen for specific risk factors and clinical indicators in order to decide on the best management options.

The Cochrane Collaboration has also conducted a systematic review of evidence regarding interventions to prevent falls in the elderly.⁶⁴ It included 62 randomized controlled trials involving more than 21,000 people. The researchers found some interventions that were supported by the evidence (e.g. muscle strengthening and balance retraining, home hazard assessment and modification for fallers, and specialized exercise interventions); others had yet to be proven.

Falls and Fractures

35

Complex continuing care residents in Ontario who had fallen in the past 180 days were on average six times more likely to have sustained a fracture than those who did not between 1997–1998 and 2002–2003.



Note: Residents are assessed on a quarterly basis during the course of a year. Residents with a length of stay shorter than 93 days were excluded.

[View Data](#)

Source: Ontario Chronic Care Patient System.

Making the Tough Calls

Health care is fraught with difficult decisions; patient safety is no exception. For example, clinicians must balance the need to get patients up and moving after surgery to prevent complications, such as pneumonia and blood clots, with the desire to prevent fractures and other injuries.

Likewise, new research suggests that while isolating patients may help to prevent the spread of disease, it may leave patients at higher risk for other adverse events. A study¹ compared the experience of patients isolated for MRSA (methicillin-resistant *Staphylococcus aureus*) colonization with that of non-isolated patients in two large North American hospitals. Isolated patients were twice as likely to experience adverse events, defined by the researchers as injuries caused by medical management. The study found that failures in supportive care, such as falls and pressure ulcers, were eight times as likely. Furthermore, isolated patients reported being less satisfied with their treatment and had less documented care.

Sometimes, trade-offs and implications go beyond risks and benefits for a particular patient. For instance, when Ontario hospitals implemented measures to control the spread of SARS, many “non-essential” services were curtailed. Between March and June 2003, elective surgery volumes were 26% lower in Toronto and 18% lower in the greater Toronto area than 2002 levels.⁶⁵ Emergency department visits were down 11.2% across all hospitals in this region.

Another area that has received considerable attention is the reuse of medical devices designed for a single use.⁶⁶ Opponents of this practice argue that hospitals cannot guarantee that they are reprocessing devices safely or that the full capabilities of the device are maintained. Others argue that dollars saved through reuse can be directed to other priorities and that

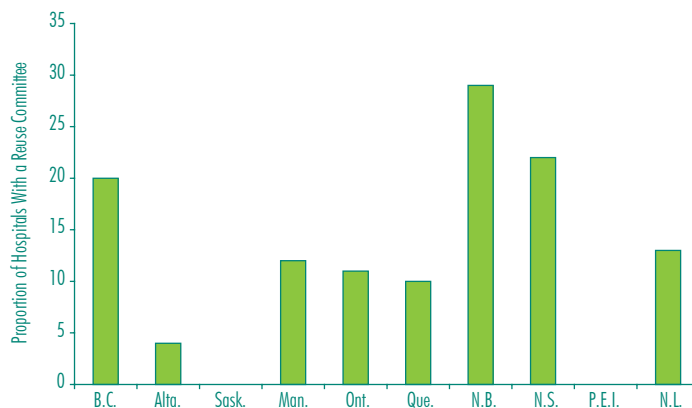
restrictions will encourage manufacturers not to make reusable devices.⁶⁷ For example, it has been estimated that Manitoba’s decision to ban the reuse of single-use devices that penetrate skin or make contact with blood or sterile body cavities cost the province about \$5.5 million.⁶⁸

In 2001, the Canadian Nosocomial Infections Surveillance Program (CNISP) surveyed 741 acute care hospitals about reuse of 67 critical or semi-critical devices and 17 others used in respiratory procedures.⁶⁹ Examples included cardiac angiocatheters and laparoscopic instruments, such as scissors. In total, 403 (53%) acute care facilities responded to the survey. For each of 25 specific devices investigated, at least some facilities reported reusing the device. Similarly, CIHI data show that 13% of dialysis facilities across the country reported reusing dialyzers in 2001, down from 16% in 2000.

Reuse Committees in Canadian Hospitals

36

The Canadian Healthcare Association recommends that health care facilities that plan to reuse medical devices establish reuse committees and protocols.* A 2001 survey found widespread reuse across Canada. Nevertheless, only 38% of hospitals with more than 250 beds and 3% of smaller hospitals said that they had reuse committees. (The survey’s response rate was 53%.)



* Canadian Healthcare Association, “The Reuse of Single Use Medical Devices: Guidelines for Healthcare Facilities,” (CHA press, 1996)

Source: M. A. Miller, D. Gravel, S. Paton, “Reuse of Single-Use Medical Devices in Canadian Acute-Care Healthcare Facilities,” *Communicable Disease Report* 27, 23 (2001): pp. 193–199.

[View Data](#)

Information Gaps: Some Examples

What We Know

- Pockets of information, often from research studies, on the prevalence and consequences of specific types of adverse events, such as medication errors, nosocomial infections, and falls in care facilities.
- Growing knowledge, based on the international research literature, about effective strategies to prevent such events.
- Limited information about the extent to which these types of strategies are currently in place in Canada.

What We Don't Know

- How do rates of specific types of adverse events and their outcomes vary across the country, both within and outside of hospitals? What explains these differences?
- What strategies are most effective in reducing the rate and impact of specific types of adverse events in different care settings and communities? What are the relative costs and benefits of these strategies?
- To what extent have strategies shown to be effective in addressing specific patient safety concerns been implemented across Canada? Why do these strategies succeed in some cases, but not in others? What would be the costs, financial and non-financial, of a decision to implement—or not to implement—specific strategies?

What's Happening

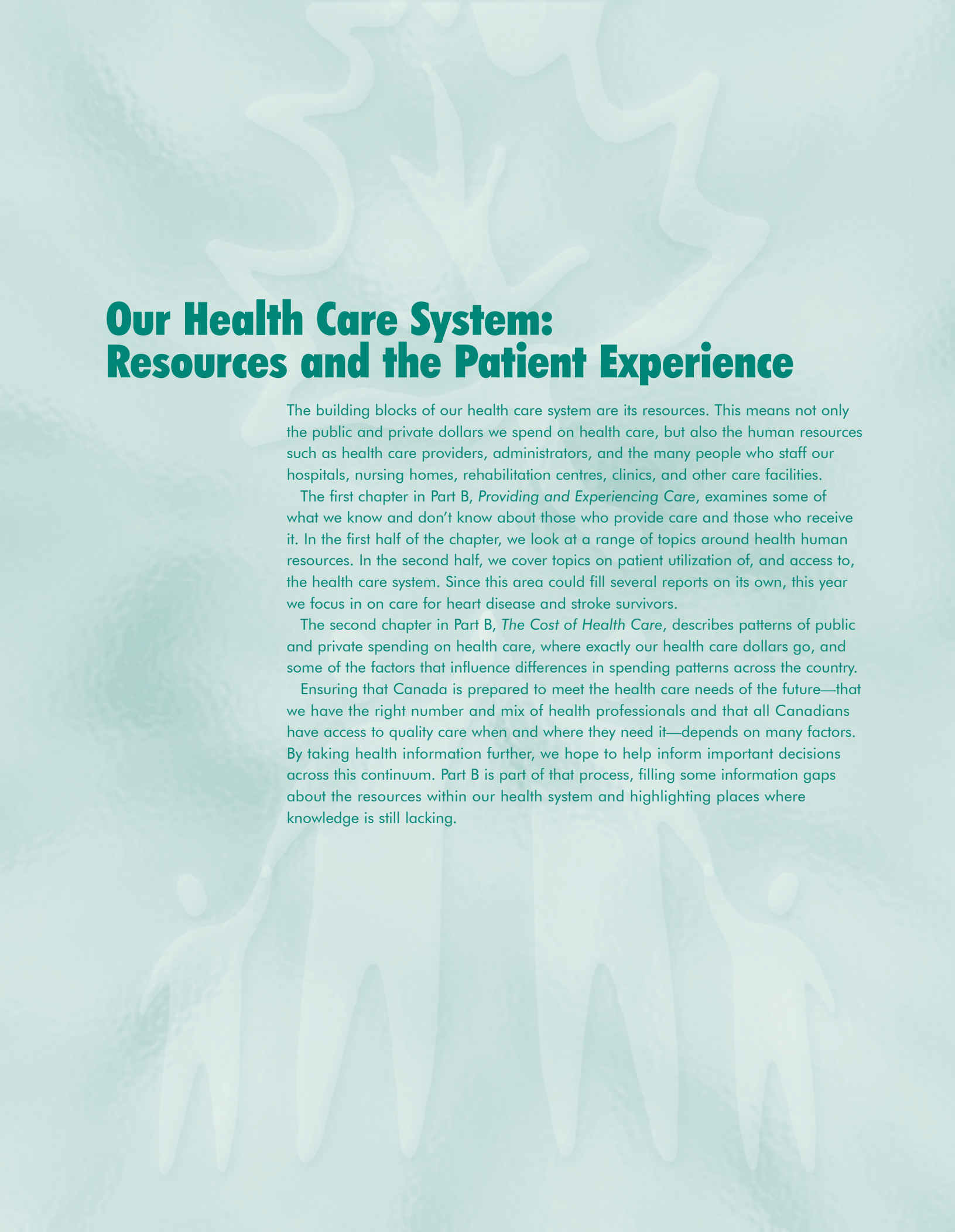
- Various initiatives are underway, from local to international levels, to improve surveillance of specific types of adverse events, such as medication incidents. This includes the development of specialized reporting systems, as well as indicators that use existing administrative data to monitor safety.
- Considerable research is in progress in Canada and elsewhere regarding effective strategies to improve patient safety.

For More Information

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The background of the page features a light teal color with a subtle, repeating pattern of stylized white human figures. These figures are depicted in various poses, some with arms raised, creating a sense of movement and human presence. The figures are semi-transparent, allowing the teal background to show through them.

Our Health Care System: Resources and the Patient Experience

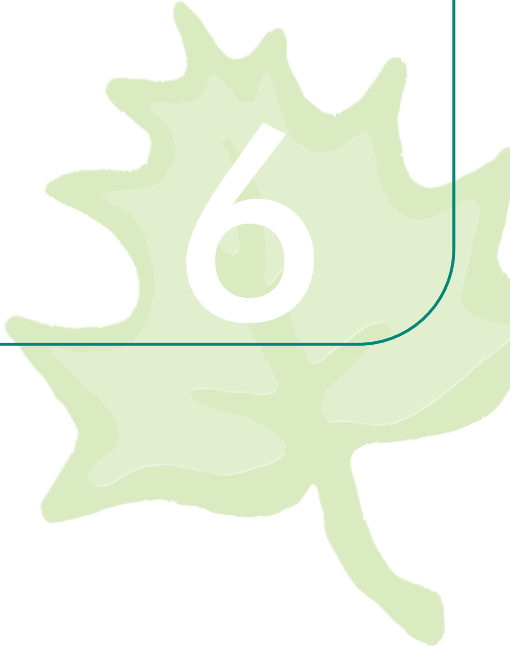
The building blocks of our health care system are its resources. This means not only the public and private dollars we spend on health care, but also the human resources such as health care providers, administrators, and the many people who staff our hospitals, nursing homes, rehabilitation centres, clinics, and other care facilities.

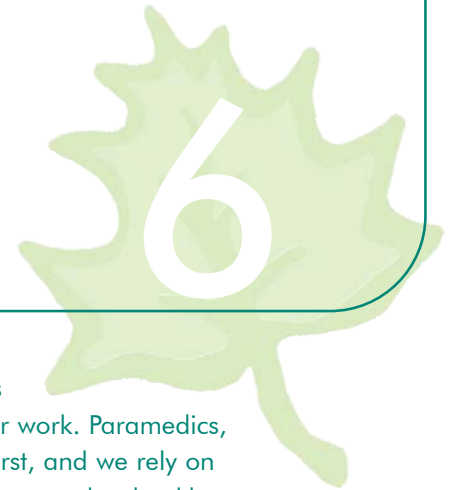
The first chapter in Part B, *Providing and Experiencing Care*, examines some of what we know and don't know about those who provide care and those who receive it. In the first half of the chapter, we look at a range of topics around health human resources. In the second half, we cover topics on patient utilization of, and access to, the health care system. Since this area could fill several reports on its own, this year we focus in on care for heart disease and stroke survivors.

The second chapter in Part B, *The Cost of Health Care*, describes patterns of public and private spending on health care, where exactly our health care dollars go, and some of the factors that influence differences in spending patterns across the country.

Ensuring that Canada is prepared to meet the health care needs of the future—that we have the right number and mix of health professionals and that all Canadians have access to quality care when and where they need it—depends on many factors. By taking health information further, we hope to help inform important decisions across this continuum. Part B is part of that process, filling some information gaps about the resources within our health system and highlighting places where knowledge is still lacking.

Providing and Experiencing Care





Providing and Experiencing Care

SARS was a potent reminder of the importance and dedication of “front-line” health care providers, as well as the risks that they may be exposed to in the course of their work. Paramedics, nurses, physicians, pharmacists, and others see patients first, and we rely on them to provide us with the best possible care. They and many other health professionals provide a broad and evolving continuum of care. This chapter examines a selection of topics related to those who provide care and those who receive it.

Providers of Care: There When Needed

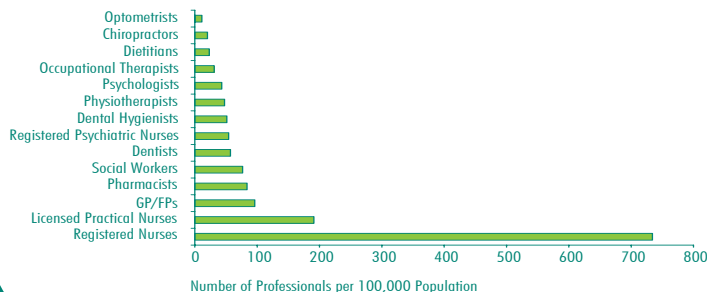
Health spending is rising, and part of the increase is going towards hiring new staff. At the end of 2002, 90,000 more people worked in health care and social assistance

than at the beginning of the year. That’s an increase of 5.7% compared with the year before, the largest growth since 1989.¹

How many health care providers will we need in the future? What mix? The answer depends on a complex set of interrelated factors, such as the population’s health and need for health care, population growth and demographics, and the patterns of practice of health professionals and the scope of services they provide. In the first half of this chapter, we touch on three issues: the aging health care workforce, education and training, and shifting scopes of practice. Since each on its own could fill a report, we encourage interested readers to refer to the references at the end of the chapter for more information.

Canada’s Front-Line Health Care Workers 37

Many professionals may be the first point of contact for those in need of care. The chart below shows the number of selected health care professionals per 100,000 Canadians in 2002.



[View Data](#)

Sources: Health Personnel Database, CIHI
Licensed Practical Nurses Database, CIHI
Registered Psychiatric Nurses Database, CIHI
Registered Nurses Database, CIHI
Southam Medical Database, CIHI

The Coming Retirement Boom

As the population gets older, so does the workforce. In 2001, the baby boom generation, then aged 37 to 55, comprised almost half (47%) of Canada’s workforce. Gradually, baby boomers are moving towards retirement, in the health sector and elsewhere. New studies are beginning to explore the timing, magnitude, and impact of the coming wave of retirements. Policy-makers are also taking note. For example, some provinces, such as Manitoba, Ontario, Quebec, and New Brunswick, are considering banning mandatory retirement at age 65.

Like people in other occupations that require significant education or experience, health professionals tend to be older, on average, than the workforce as a whole. Across all health occupations, the average age in 2002 was 41.2 years. That compares with 39 years overall.

Projecting RN Retirement

Canada's registered nurses (RNs) are getting older, and many will soon be reaching retirement age. CIHI data show that the average age of registered nurses was 44.2 years in 2002, up 1.6 years from 1998. As well, in 2002, there were more RNs in the Canadian workforce aged 55 to 59 (12%) than aged 25 to 29 (7%).²

According to a joint study³ released in 2003 by CIHI and the Nursing Effectiveness, Utilization, and Outcomes Research Unit at the University of Toronto, retirement pressures are coming soon. Assuming a retirement age of 65, Canada would lose 29,746 RNs aged 50 or older by 2006. That's 13% of the 2001 nursing workforce. Alberta (9% loss) and the Atlantic region (10%) are likely to be least affected. Quebec, on the other hand, would lose 16% of its 2001 nursing workforce.

But health professionals often retire before age 65. In fact, about half (49%) did so between 1997 and 2000. Projections assuming a retirement age of 55 estimate even greater losses by 2006: 64,248 RNs aged 50 or older, or 28% of the 2001 nursing workforce. Under this model, losses would range from 22% of RNs in the Atlantic region to 32% in British Columbia.



Training the Next Generation

Ensuring that the right number of new entrants, with the appropriate mix of skills, come into the health sector as the current generation retires is a challenge.

While the level and length of education required varies from occupation to occupation, it takes a long time to train most health professionals.

Credential Creep or Prerequisite?

Many health professions are pushing for longer educational requirements to enter practice. For example, in the late 1990s, RNs were told that they would require a baccalaureate degree within the next 10 years in order to practise. Similarly, medical radiation technologists, who currently require a college diploma, will need a degree by 2005 in order to obtain the certification required to practise in Canada.

Proponents argue that more education is needed to respond to the growing complexity in health care, changing roles of members working in interdisciplinary teams, the increased acuity of patients seeking care, and other factors. They tend to equate higher credentials with improved care. Some research supports this view. For example, a recent U.S. study⁵ found that hospitals that had a higher proportion of nurses with degrees tended to have lower risk-adjusted death rates and failure-to-rescue rates for surgical patients. Results were adjusted for hospital structural characteristics, patient characteristics, nurse staffing, nurse experience, and whether the patient's surgeon was board certified.

But not everyone agrees. Many argue that increasing credentials are not always necessary. They suggest that across-the-board "credential creep" can result in skills being unused, as well as higher costs for those seeking to enter a health profession. They point to research that shows that, in some cases, health professionals with different educational backgrounds can provide equally good care.⁶

To wrestle with the impact changing educational requirements may have on health human resource planning, public policy, legislation and regulation, compensation, and supply, the federal, provincial, and territorial deputy ministers of health directed the Advisory Committee on Health Delivery and Human Resources (ACHDHR) to develop a working group on entry-to-practice credentials. The working group is responsible for providing policy advice and developing recommendations on how to improve assessment of requests for changes in entry-to-practice credentials. Their recommendations will include the development of principles and policies "to assist governments in determining whether a request for a change in an entry-to-practice education credential is based on a comprehensive, impartial process, which serves the interest of patient care and the effectiveness of health care delivery in their respective jurisdictions."⁷ Deputy ministers have advised professional associations and accrediting bodies that decisions or actions to make changes to entry-to-practice credentials may be postponed until the working group has reported.

Getting Older in Health Care

38

The average age of Canada's population is increasing. Between the 1991 and 2001 censuses, for example, the proportion of the working population aged 45 to 64 increased. This trend is more pronounced for people in health occupations than for those in the workforce as a whole.



Source: Censuses, Statistics Canada.

[View Data](#)

In some cases, training requirements are also increasing. For instance, the number of RNs with a baccalaureate degree in nursing (rather than a college diploma) is rising. The growth reflects both more mid-career RNs returning to university and increasing numbers of nurses entering practice with a degree.⁴ New educational programs and qualifications are also emerging. One of the best-known examples is the growth of a range of nurse practitioner degree options.

Shifting Scopes of Practice

Should pharmacists prescribe drugs? What about nurses with advanced training? What care should paramedics be trained to give before they get their patients to the hospital? In Canada and elsewhere, roles are shifting at every level of care.

Typical doctors of today provide a different range of services than their colleagues in the past; the same is true for many other health professionals. In some cases, roles are expanding. For example, in late 2003, the Alberta College of Pharmacists recommended to the Health Professions Advisory Board that pharmacists be granted limited authority to prescribe drugs and administer some injection drugs and vaccines to Albertans.⁸ However, many health professionals do not provide the full range of services for which they were trained.

Changing scopes of practice have become critical considerations for designing educational programs, as well as health human resource planning. Several government reports^{10, 11} have addressed the need to reconsider typical scopes of practice to support more effective and efficient health care services. For example, these reports have discussed the changing roles of nurses and other health care providers and the movement to interdisciplinary health care teams.

Shifts for Family Doctors

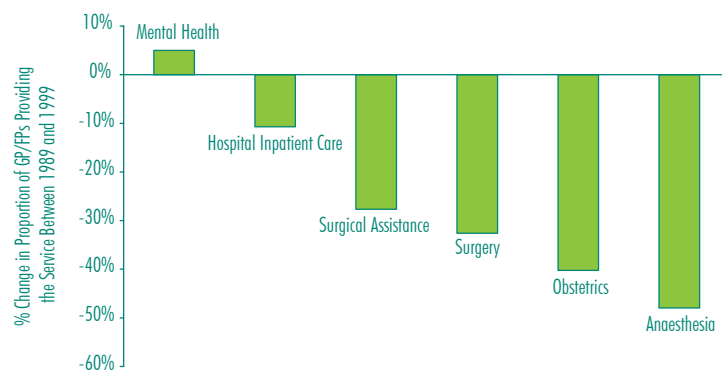
The letters after their name may be the same, but the range of services that family doctors provide varies greatly. Some services, such as mental health counselling, are becoming more common; but fewer family doctors are now involved in areas such as hospital inpatient care, surgical assistance, and delivering babies.

That said, the scope of services that family doctors provide varies across the country. For example, the proportion of family physicians attending deliveries ranged in 2001 from 8% to 69%, depending on the province or territory.⁹ Family physicians in the western provinces and the territories were more likely to deliver babies than those in central or Atlantic Canada. Likewise, family physicians in group practices were more likely to do so than others.

What Family Doctors Do Is Changing

39

The range of services that family physicians provide is changing. General practitioners and family physicians billing provincial fee-for-services insurance plans were more likely to provide mental health services in 1999 than in 1989, but less likely to undertake some other types of care, such as caring for patients in hospitals and surgery.



[View Data](#)

Source: National Physician Database, CIHI.

Effectiveness of Team Care

Management gurus have touted the importance of teamwork for years. In health care, too, interdisciplinary/multidisciplinary health care teams have become a subject of research and policy interest. Many questions remain to be answered, but some results are beginning to emerge. For example, a recent study in the UK¹² found that having health care providers from various disciplines work together in primary health care can lead to not only a higher quality of care for patients, but also better mental health among the providers. This study found that organizations with a higher proportion of staff working in multidisciplinary teams tend to have lower patient mortality, after adjusting for health needs and hospital size.

New research is exploring how the mix of staff in care teams and other characteristics of the working environment may be related to patient outcomes. This work builds on the hundreds of studies from other industries linking working conditions and job satisfaction to productivity, quality, and the health of workers. Interesting results in health care are beginning to emerge. For example, U.S. researchers found links between higher levels of staffing by registered nurses and quality of care for some, but not all, quality measures and groups of patients.^{13, 14}

Increasingly, teamwork is emphasized from the start of training. For example, in February 2002, the University of British Columbia established the College of Health Disciplines.¹⁵ The College in itself is not a faculty, but is affiliated with seven faculties: agricultural sciences, applied science, arts, dentistry, education, medicine, and pharmaceutical sciences. These faculties encompass 16 health and human service programs. The College's aim is to foster interdisciplinary education and cultivate an environment that promotes an "interprofessional culture through innovative student learning, collaborative research, and better practices" for health and human service practitioners.¹⁵ Several other universities have related initiatives.

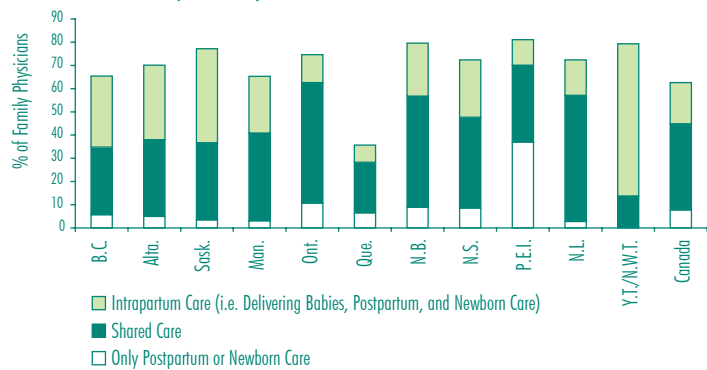
Experiencing Care

From womb until death, health care touches us at many points in our lives. Services range across a broad continuum of care, from visits to a pharmacy for advice on caring for the flu to high-tech diagnosis and intensive care treatment in hospital.

Sharing Care

40

In Canada, most family physicians involved in maternity and newborn care provide "shared care." This means that they provide prenatal care up to a certain number of weeks of pregnancy (often between 24 and 30 weeks) and then transfer care to another provider, such as an obstetrician, a midwife, or another family physician who delivers babies. Some family physicians also attend deliveries, but the proportion varies across the country. In a 2001 survey, 66% of family physicians providing some care for pregnant women and/or newborns in the Yukon Territory and the Northwest Territories said that they delivered babies, compared to 7% and 12% respectively in Quebec and Ontario.



Note: Data for Nunavut were not available. Also, data for the "only postpartum or newborn care" category were not available for the Yukon Territory and Northwest Territories.

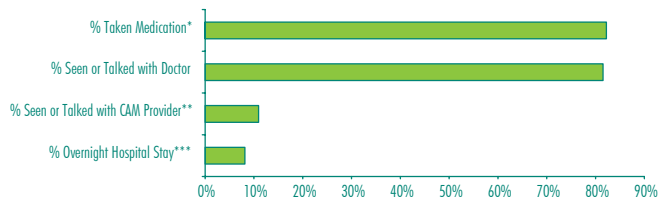
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Source: 2001 National Family Physician Workforce Survey, part of the JANUS Project, College of Family Physicians of Canada.

Receiving Care

41

Health care is diverse and changing. In 2000–2001, most Canadian teens and adults said that they had received some type of care in the past 12 months. Taking medication and consulting a doctor were the most common types of care reported. A smaller percentage of the Canadian population saw or talked with a complementary or alternative medicine (CAM) practitioner or stayed overnight in a hospital.



Notes: *Includes prescription and non-prescription medication. **CAM practitioners include massage therapists, acupuncturists, homeopaths or naturopaths, Feldenkrais or Alexander teachers, relaxation therapists, biofeedback teachers, Rolfers, herbalists, reflexologists, spiritual healers, religious healers, others. ***Also includes overnight stay in nursing home or convalescent home.

View Data

Source: Canadian Community Health Survey, Statistics Canada.

The Changing Nature of Medical Imaging in Canada

CIHI's first report on medical imaging, released in September 2003, showed that the supply of MRI (magnetic resonance imaging) and CT (computed tomography) scanners and the number of scans performed have risen dramatically in the past decade, although the distribution of major imaging equipment varies across the country. (The report can be downloaded free of charge from www.cihi.ca.)



Canada had a total of 147 MRI scanners in January 2003, compared to 30 in 1993, an increase of nearly 400%. The number of CT scanners rose by about 50% over the same period, from 216 in 1993 to 326 in January 2003. The country also had 594 nuclear medicine

cameras, 165 angiography suites, 94 catheterization labs, and 14 positron emission tomography (PET) scanners in January 2003.

Provincial data show volumes of scans have also risen sharply in recent years. The volume of outpatient MRI scans funded through the Ontario Health Insurance Plan, for example, rose by nearly 500% in the 1990s, from about 25,000 scans in 1992 to about 146,000 in 2001. Likewise, in five provinces where trends were available, CT scans increased by at least 50% between 1994 and 2000.

New survey data suggest that scan rates are continuing to rise. In a 2001 Statistics Canada survey, 6.7% of Canadians age 15 and over reported receiving a non-emergency MRI, CT, or angiography in the past year. A smaller survey conducted for CIHI in the fall of 2003 saw more than one in 10 Canadian adults report having had one of these scans.

While most Canadians continue to visit a family doctor at least once a year, use of other services varies significantly across the country and has changed over time. For example:

- We're much more likely than in the past to visit a complementary/alternative health care provider (11% of Canadians 12 years and older did so in 2000–2001, up from 5% in 1994–1995).
- Fewer people are staying overnight in hospital (inpatient volumes fell from 3.6 million in 1985–1986 to 2.9 million in 2000–2001), and those who are hospitalized have shorter average lengths of stay (10.4 versus 7.2 days).
- Day surgery, in contrast, is much more common, accounting for more than half (50.6%) of inpatient and day surgery hospitalizations in 2001–2002.*
- The nature of hospital care is changing. While most babies are still born in hospital, patients are now rarely admitted for some conditions that used to be common reasons for hospital stays, such as cataracts and tonsillectomies. Rates of some other types of care, such as hip replacements, have more than doubled since the mid-1980s.
- New technologies are also changing care in other ways. For example, Canadians in most parts of the country can now call registered nurses to ask about their health problems. The nurses use on-line decision support systems to help decide what advice to give to each caller.

For Richer, for Poorer

Patterns of health and disease are largely a consequence of how we learn, live, and work.¹⁶ In Canada and around the world, for instance, dozens of studies have found links between income and health. Those with higher incomes tend to have a longer life expectancy and better health than middle-income individuals. They, in turn, tend to fare better than those with low incomes.

Use of health services also varies by income. To see how, we divided Canadians 12 years and older into five equally sized groups based on their household income. In 2000–2001, members of the lowest income group were:

- More likely to have stayed overnight in hospital in the past year than those with higher incomes;
- About as likely to have visited a physician at least once; and
- Less likely to have visited a dentist (although dental care is typically not covered by provincial health insurance plans).

Recent research from Manitoba suggests that despite poorer health on average, low-income Canadians use less health care services than expected. Services are used the most by very ill people from all income levels.¹⁷

Canada is not alone in seeing variations in the use of health services by income. Survey data from the U.S. and Australia show similar patterns, although the magnitude of the difference in use between income groups differs by country and type of care.

* Excludes Alberta, Saskatchewan, Manitoba, and Quebec.

A new study suggests that it doesn't always have to be this way. Sumit Gupta and Leslie Roos found that mammography rates increased across all income groups after an organized breast screening program with mobile clinics and active outreach was introduced in Manitoba.¹⁸ Overall, screening rates grew from 20% in 1995 to more than 45% in 1999. The program was particularly effective in rural areas, almost eliminating disparities in screening between women at the top and bottom of the income scale. (The study also examined two preventive programs which changed little over this period: childhood immunization and cervical cancer screening. Participation rates in both cases were relatively stable.)

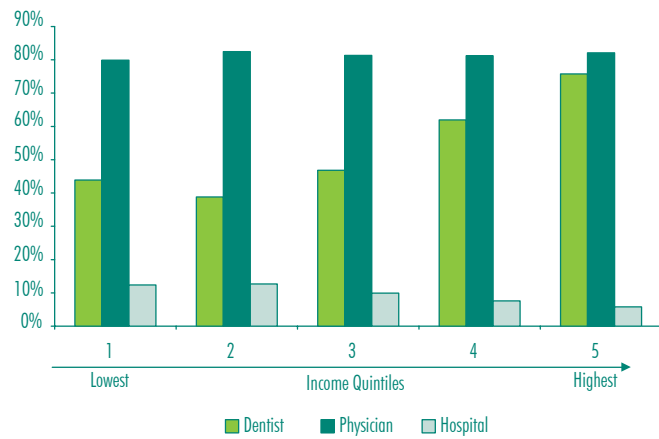
A Focus on Heart Attacks and Strokes

Every year, CIHI's reports highlight a range of specific health and health care indicators for regions across the country. All are included in *Health Indicators 2004*, but we have chosen to focus on those related to heart attacks and strokes in the body of the report this year. These conditions continue to represent a substantial burden of illness for Canadians. In 2002, for example, circulatory diseases were among the leading causes of death for both women and men. They accounted for 15% of all hospitalizations in 2001–2002.

Income Matters

42

Canadians are all entitled to first-dollar insurance coverage of medically necessary services provided by physicians and hospitals. Nevertheless, there are differences in how these services are used. The chart below divides the population aged 12 and over into five equally sized groups (called "quintiles") according to their household income. Low-income Canadians (who tend to be in poorer health) were more likely to have stayed overnight in hospital in the last 12 months in 2000–2001, but much less likely to have visited a dentist. Canadians of all income levels were about equally likely to report having visited a doctor in the last year.



[View Data](#)

Source: Canadian Community Health Survey, Statistics Canada.



Walking to Better Health: Taking Action on Health Indicators

In the city and the country, communities across Canada are using health indicators to plan health services and to promote health. In September 2003, for example, residents of Miramichi, New Brunswick, and the surrounding area were asked to walk at least 30 minutes most days for eight weeks. Issued by the Miramichi Action for Nutritional Guidance Opportunities program, along with partners such as the health region, the city, and ski and health centres in the area, the call to action cited data from the indicator project showing that Miramichi and the surrounding region had the highest rate of heart attacks and strokes in the province.

Over 200 people participated in this walking challenge. All reported maintaining or increasing their amount of exercise over the eight weeks, and 99% said they were going to continue exercising after the challenge was over.¹⁹ Efforts to increase physical activity in the community have also continued.

Outcomes of Care

Overall heart attack and stroke outcomes seem to be improving slightly, but substantial differences continue to exist across the country. Between 1997–1998 and 1999–2000, about 12.6% of patients hospitalized with a new heart attack died in hospital within 30 days.† The latest overall three-year average (1999–2000 to 2001–2002) is 11.8%. Regionally, however, rates varied from a high of almost 16% to a low of 8% in both periods.

† These charts include deaths in any hospital during this period, not just the first hospital stay. They cover all provinces and territories except Newfoundland and Labrador, Quebec, and British Columbia. For more details regarding the methodology and interpreting the indicator, please see the health indicator technical notes available at www.cihi.ca.

Selected Indicators Related to Heart and Stroke

Since 1999, CIHI and Statistics Canada have collaborated in developing a broad range of regional health indicators. Many of these indicators are relevant for thinking about heart disease and stroke. Examples are shown below. Additional indicators and corresponding data by health region are available on the health indicators e-publication, accessible through www.cihi.ca.

Health Status

- In 2000–2001, 13% of Canadians (age 12+) reported having been diagnosed with high blood pressure.⁺
- 32% of Canadians age 20 to 64 were overweight or obese (they had a body mass index higher than 27).^{*}

Determinants of Health

- 26% of Canadians (age 12+) smoked daily or occasionally.^{*}
- 28% (age 12+) were exposed to second-hand smoke in the last month.^{*}
- Less than 8% of Canadian families lived in low-income households in 2001.⁺
- 37% of Canadians (12+) reported eating at least five fruits and/or vegetables per day.^{*}
- 26% (age 18+) experienced “quite a lot” of life stress.^{*}
- 43% (age 12+) were active or moderately active in their leisure time.^{*}

Health System Performance

- Almost 12% of patients hospitalised with a new heart attack died within 30 days between 1999–2000 and 2001–2002.^{**}
- Almost 19% of patients hospitalised with a new stroke died within 30 days between 1999–2000 and 2001–2002.^{**}
- About 4% of heart attack patients had unplanned readmissions within 28 days of their initial hospitalization between 2000–2001 and 2002–2003.^{**}

Community and Health System Characteristics

- There were 30,258 family physicians in Canada in 2002, or 96 per 100,000 population.^{***}
- There were 230,957 registered nurses in Canada in 2002, or 734 per 100,000 population.^{****}

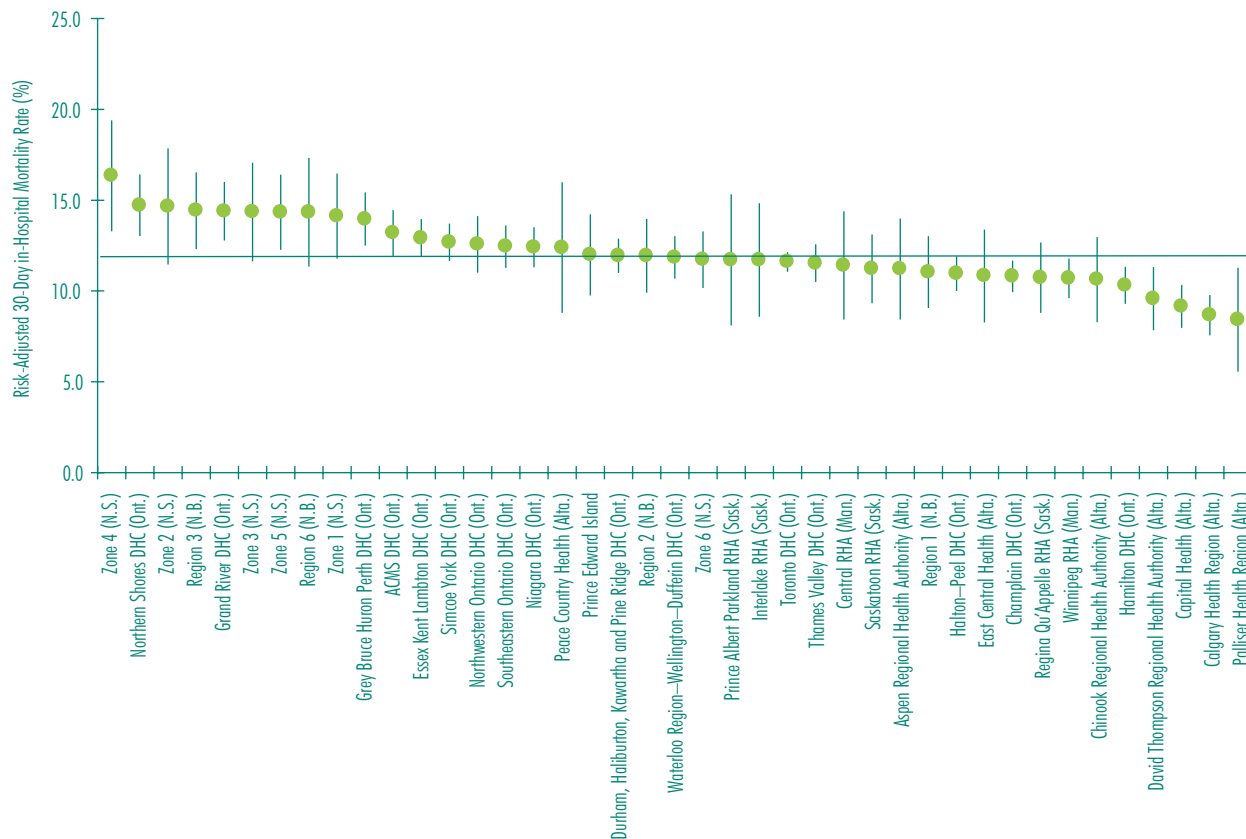
Source: ⁺Statistics Canada; ^{*}Health Indicators 2003; ^{**}Health Indicators 2004; ^{***}Southam Medical Database, CIHI; ^{****}Registered Nurses Database, CIHI.

Several factors may drive differences in survival rates between regions within a province. Care in hospital matters, but a variety of other factors also come into play. These include the underlying health of the population within a region, patients’ socio-economic status, family and social support, the severity of the illness, preventive interventions, and patient demographics.^{20–22}

New data are now available for one patient demographic factor: sex. Although heart disease is a leading cause of death among both males and females, a recent report by the Canadian Cardiovascular Outcomes Research Team (CCORT) suggests

Surviving a Heart Attack—An Update

Overall, 11.8% of patients hospitalized with a new heart attack died in hospital within 30 days of their admission between 1999–2000 and 2001–2002. Most regions had rates similar to the Canadian average. But rates in some regions were higher or lower, even after adjusting for age, sex, and co-existing illness. Results for regions with 75,000 or more people are shown below. The rates are estimated to be correct to within the range shown by the vertical bars 19 times out of 20. The solid line shows the overall average.



Note: Comparable data are not currently available for Newfoundland and Labrador, British Columbia, and Quebec due to differences in how data are collected.

Source: Hospital Morbidity Database, CIHI.

[View Data](#)

that men in certain age groups are up to five times more likely to be hospitalized for a heart attack.²³ Researchers also found that men have double the rate of mortality for ischemic heart disease, which includes heart attacks (188.8 per 100,000 population versus 97.3 per 100,000 between 1995 and 1997).²⁴

This year, we looked for the first time at whether survival also varies for men and women. The answer was yes. Women were admitted with new heart attacks less often than men, but those who were hospitalized were more likely to die within 30 days (12.5% versus 11.3%). The same was true for strokes (19.1% mortality compared with 18.2%) but the difference was not statistically significant. As in other areas, death rates for both these illnesses varied across the country.

When Further Care Is Needed

For some people, a heart attack or stroke is fatal; but for many more, it is not. These patients may require a range of specialized care, from surgery to rehabilitation.

Each year, thousands of Canadians have heart surgery. Some need care immediately; for others, there is a window in which care will be most effective. Pockets of data on cardiac surgery wait times exist across the country, some of which we profiled last year. Additional information is also being developed. For example, Ontario researchers recently examined risks associated with waiting

Waiting for Care

Access to care, when and where needed, is an important issue for Canadians. Research suggests that there are many factors that may affect how long people are in the queue. For example, it may depend on what type of care they need, where they wait, where they live, if they are waiting to see a specific physician, how urgently they need care, how many other patients are on the roster, if they are suffering from any complications that could delay the procedures, and when the need for care arises.

On-Line Wait-Lists

45

Increasingly, provinces are making information about wait times for various elective surgeries and diagnostic procedures available on public Web sites. Alberta, Quebec, and Manitoba are the most recent provinces to post wait time data on the Web. The table below summarizes what types of information about elective (non-urgent) procedures various provinces post on-line. Most Web sites provide recent data on median wait times and the number of patients waiting for various procedures. Some individual health regions and institutes also post wait time information, but they are not included here.

Province	Organization Registry/Web Site	Angioplasty	Cancer Treatment ²	Cardiac Catheterization	Cardiac and/or Cardiovascular Surgery	Cataract Surgery	Corneal Transplants	Dental Surgery	Diagnostic Services ³	Ear, Nose, or Throat Surgery	Eye Surgery	General Surgery	Heart Bypass	Hip and/or Knee Replacement	Gynecological Surgery	Neurosurgery	Obstetrical Surgery	Organ Transplants	Other Orthopaedic Surgery	Other Day Surgeries	Other Surgeries w/ Hospitalization	Plastic Surgery	Urological Surgery	Vascular Surgery	Level of Data
B.C.	B.C. Surgical Wait List Registry ¹ www.healthservices.gov.bc.ca/waitlist/provdata.html		X		X	X	X	X		X	X	X		X	X	X		X	X			X	X	X	Province Hospital Physician
Alta.	Alberta Wait List Registry www.health.gov.ab.ca/waitlist/WaitListData.jsp		X		X	X			X	X		X	X	X		X			X			X	X		Province Hospital Diagnostic Clinics
Sask.	Saskatchewan Surgical Care Network www.sasksurgery.ca				X			X		X	X	X			X	X	X					X	X		Province Regional Health Authority
Man.	Manitoba Health Services Wait Time Information www.gov.mb.ca/health/waitlist/index.html		X						X																Province Hospitals Cancer Care Man.
Ont.	Ontario Cardiac Care Network www.ccn.on.ca/access/waittimes.html	X		X	X																				Province Geographic Region Hospital
Que.	Quebec Ministry of Health and Social Services http://206.167.52.17/app/g74web/default.asp	X	X	X	X	X								X						X	X				Province Region Hospital

Notes:

¹ Data for cancer treatment, corneal transplants, and organ transplants obtained at the provincial level only.

² Cancer treatment can include radiation therapy (radiotherapy) and chemotherapy.

³ Diagnostic services include MRI and CT scans in most jurisdictions. Manitoba also reports stress MIBI and bone density.

Source: Compiled by CIHI.

for cardiac catheterization between 1998 and 2000.²⁵ The study included over 8,000 patients. Their median wait (where half had waits shorter than this time, and half had longer waits) was six days for inpatients and 60 days for outpatients. In total, 50 patients (0.6%) died while waiting, 32 (0.4%) had a heart attack, and 41 (0.5%) experienced congestive heart failure. The authors suggest that some of these situations could have been prevented with earlier catheterization and expedited revascularization, especially for outpatients who were at higher risk of experiencing adverse outcomes.

Surgical interventions are less common for stroke patients, but they often need other types of care. For example, stroke patients accounted for about 20% of all discharges from inpatient rehabilitation programs in 2002–2003.

Waiting for Rehab

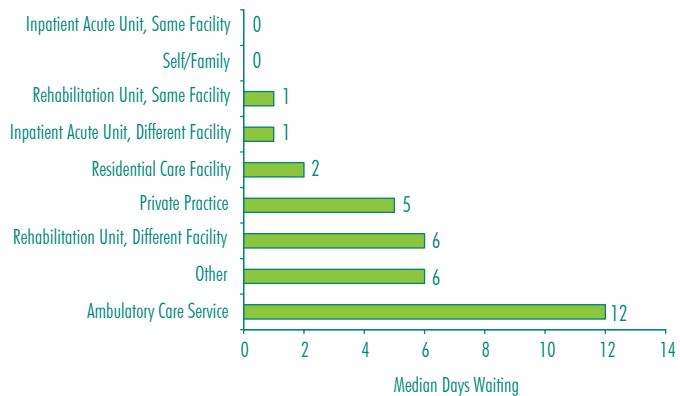
Waiting times can be measured in many ways, starting and stopping the clock at different points along a care path. CIHI tracks waits for inpatient rehabilitation between when the client is clinically ready to start rehabilitation and has met admission criteria to the day of admission. In some cases, clients may be put on a waiting list before they are deemed clinically ready for rehabilitation. This time is not captured.

When admitted to rehabilitation care, stroke patients were less able, on average, to manage daily activities (such as eating, walking, speaking, and understanding instructions) than other patient groups. However, along with those admitted for spinal cord dysfunction, they had the second largest average improvement (after brain dysfunction patients) in overall functioning during their stay. (Comparable data for patients cared for outside of inpatient rehabilitation programs are not available.)

Waiting for Rehabilitation

46

Thousands of Canadians each year receive inpatient rehabilitation services. In 2002–2003, 71 facilities in six provinces tracked wait times for these services through the National Rehabilitation Reporting System. Overall, four in 10 patients (42%) were admitted on the day they were referred. About half (52%) of those referred by inpatient and rehabilitation units of the same facility waited one day for care. Median wait times ranged from two to 12 days for patients who were referred by residential care facilities, private practices, other rehabilitation facilities, ambulatory care services, and other sources. Collectively, however, these clients accounted for 6% of those who were deemed ready for admission.



Note: The date ready for admission was not known for 23% of clients discharged in 2002–2003. These clients were excluded from the analysis.

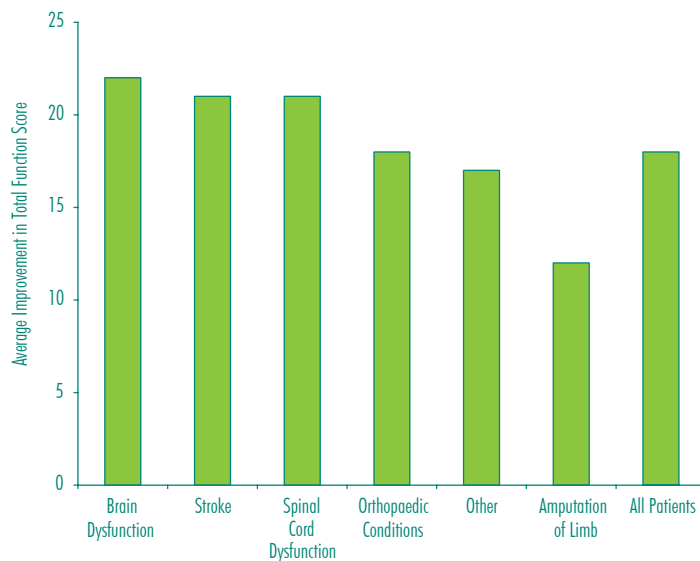
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Source: National Rehabilitation Reporting System, CIHI.

Improved Functioning

47

One of the goals of rehabilitation is to help patients improve their ability to manage activities of daily living, such as walking, eating, speaking, and understanding instructions. In 2002–2003, 71 facilities in six provinces participated in the National Rehabilitation Reporting System to track changes in function of patients between admission and discharge. On average, patients who had a stroke, spinal cord dysfunction, or brain dysfunction showed most improvement in overall function during their stay. Limb amputation patients had the smallest average gains (12 points); however, they had the highest average score on admission (96) meaning that they had minimal limitations in functioning upon admission. At discharge, the functional score was among the highest for this patient group. (The total possible score is 126.)



[View Data](#)

Source: National Rehabilitation Reporting System, CIHI.

Inpatient rehabilitation tends to be relatively short, but some stroke patients require additional support, in health care facilities or at home. The same, of course, is true for those with many other types of health conditions. Overall, Statistics Canada counted 3.4 million Canadians aged 15 and over with a disability in 2001, 41% of which were severe or very severe.²⁶ Just under half of those with disabilities (47%) said that they needed some type of assistive device, such as a wheelchair, arm or hand support, or hearing aid. Most (61%) said that they had all the specialized equipment that they needed, but the rest reported unmet needs. High cost, cited by 48% of respondents with unmet needs, was the most common reason reported for not having equipment. The next most common reason cited was a lack of insurance coverage for the equipment (36%).²⁷

Most Canadian adults with disabilities (65%) report receiving or needing help to carry out everyday activities, such as meal preparation, housework, heavy household chores, transportation, personal finances, child care, personal care, or moving around within the home. About two in three said that they got all the help that they needed. Rates were lower for those with more severe disabilities. Families and friends were the most common sources of help. Less than a quarter who said that they needed help (22%) reported receiving assistance from organizations and agencies.²⁷

Needing Help

48

In 2001, about 771,000 adults (aged 15 and older) with disabilities in Canada's provinces said that their needs for help with everyday activities were not fully met. They cited a variety of reasons for this circumstance, as shown below.



Note: Respondents could indicate more than one reason for their unmet needs.

[View Data](#) Source: 2001 Participation and Activity Limitation Survey, Statistics Canada.

Information Gaps: Some Examples

What We Know

- The supply, distribution, and scope of practice of selected health care providers and how they have changed over time.
- How often Canadians use various types of health services, inside and outside of hospitals.
- How a range of health and health care indicators, such as death rates in the first 30 days after initial hospitalization with a heart attack, differ across the country and are changing over time.
- Growing information, albeit often not comparable, on waiting times for elective surgery and other types of care.
- What types of care and support Canadians with disabilities report needing and receiving.

What We Don't Know

- How many and what mix of health professionals will be required to meet the health needs of Canadians nationally, provincially, and regionally? How will changes in enrolments, entry-to-practice requirements, education programs, provider demographics and working conditions, and other factors affect this mix?
- How healthy are Canada's health professionals? What occupational factors affect their health and professional satisfaction? What effect do these factors have on patient care and costs?
- What explains regional differences in utilization of health services, mortality, readmissions, survival, and other outcomes of care?
- How do wait times for different types of care vary across the country? How often do Canadians receive care within recommended periods of time? What effect does this have on patient outcomes, the cost of care, and public confidence in the health system?
- What is the relationship between how much we spend on particular interventions and the benefits that they provide?

What's Happening

- *Building the Future: An Integrated Strategy for Nursing Human Resources in Canada* is designed to provide comprehensive research on registered/licensed practical nurses, registered nurses and registered psychiatric nurses. The first report (on the global nursing labour market) was released in March 2004. Other reports are expected to follow later in 2004.‡
- In May 2004, the Canadian Medical Association, College of Family Physicians of Canada, CIHI, and Royal College of Physicians and Surgeons of Canada launched a joint pan-Canadian survey of 70,000 active clinicians, students and residents, administrators, and clinical teachers.
- In fall 2003, CIHI released initial reports on workforce trends of licensed practical nurses and registered psychiatric nurses. As well, updated data on health personnel trends in Canada for 1993 to 2002 were released in spring 2004.
- CIHI's new special reports on topics such as medical imaging and health care for mothers and babies are designed to provide a more in-depth look at specific types of care.
- Several on-going initiatives are designed to develop data to support improved understanding of care provided outside of hospitals. Over the past year, progress has been made in a number of areas, including continuing care, prescription drug use, home care, mental health, and rehabilitation care.

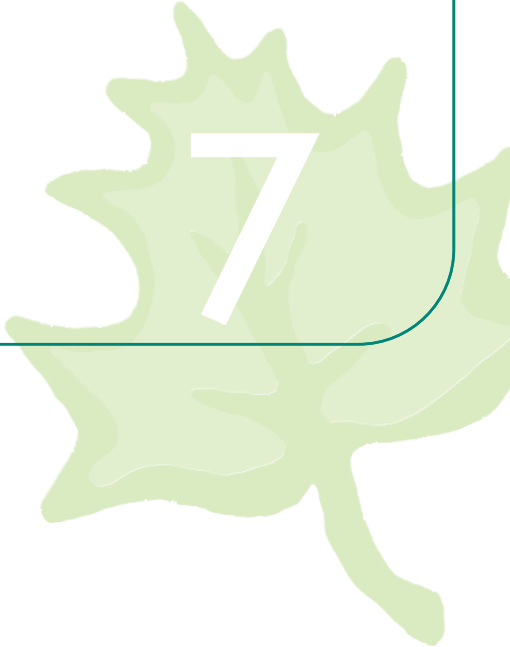
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The Cost of Health Care





The Cost of Health Care

Money is central to discussions of the future of our health system: how much to spend, where to get it from, and where it should go. These questions help focus attention on how to renew the health system to promote good access and high quality at an affordable price. Recently, spending has risen significantly, creating an interest in identifying the factors driving the increases. The short answer: spending on items such as new health technologies and prescribed drugs has risen fastest, with slower across-the-board increases in other categories, such as hospitals and physician services. In this chapter, we look at how much we actually spend on health care in Canada, how our health dollars are used, and why expenditures may vary across provinces and territories.

Spending on Health Care

In 2003,* Canada spent a forecast \$121.4 billion on health care, or an average of \$3,839 per person. This brought health care's share of the total economy—the gross domestic product, or GDP—back to its historic high of 10%, first reached in 1992. (In between, it retreated to a low of 8.9% in 1997.)

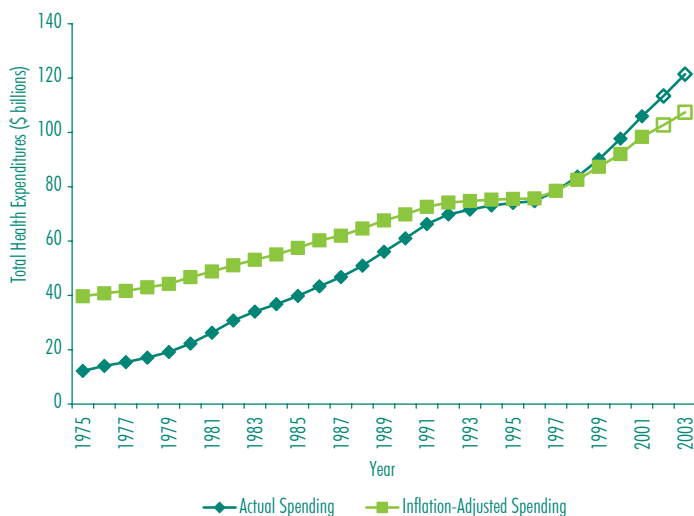
Canadian health care spending, both in absolute terms and as a percentage of GDP, has moved in cycles. During the mid-1990s, total health care spending barely grew and public-sector spending actually declined in real per capita terms. Economic growth outpaced increases in health care spending during this period. As a result, the share of GDP accounted for by health care declined. Since then, the reverse has been true. This general pattern has occurred in recent years among many Organisation for Economic Co-operation and Development (OECD) countries, although the fluctuations have been greater in Canada than in many other nations. In 2001, the latest year for which comparable figures are available, Canada (at 9.7% of GDP) was well behind the U.S. (13.9%), but close to Switzerland (10.9%), Germany (10.7%), and France (9.5%).¹

Among OECD countries, both per capita health spending and its share of GDP have risen since 1960. In order to facilitate comparisons of per capita spending among member countries, the

Total Expenditures on Health Care

49

We now spend over \$100 billion more on health care than in 1975. Even when adjusted for inflation, total (public and private) spending on health care (in constant 1997 dollars) continues to rise.



Note: 2002 and 2003 figures cited are forecasts.

[View Data](#)

Source: National Health Expenditure Database, CIHI.

* All 2003 figures cited in this chapter are forecasts.

OECD uses a tool called Purchasing Power Parity (PPP). PPPs are rates of currency conversion that equalize the purchasing power of different currencies. Using this method, a given sum of money when converted will buy the same amount of goods and services in all countries.² For 2001, in U.S. PPP-adjusted dollars, per capita spending for health care was highest in the U.S., at \$4,887. Canada ranked fifth at \$2,792, behind Switzerland (\$3,322), Norway (\$2,920), and Germany (\$2,808).³

Which Measure Is Best?

As this chapter shows, health spending can be measured in many different ways—total spending, dollars per person, and share of GDP, to name just a few. Which measure is best depends on what we want to know. If we are concerned about the sustainability of the health care system and its effects on the overall economy, the GDP measure is important. So, too, is the percentage of government budgets devoted to health care. If we want to know about the amount of health care available to the public, real per capita growth in spending may be a better measure. No single measure provides a complete picture of health spending in the larger context of societal resources.

Health Care Spending per Person

Canadians spent about \$3,839 per person on health care in 2003. This marked an after-inflation increase of 30% from 1993 and 62% from 1983. Though there was some variation in per capita spending among the provinces, the most significant outliers were Canada’s sparsely populated northern territories. Their spending in 2003 ranged from \$4,648 in the Yukon Territory to \$6,800 in the Northwest Territories.

Why the variation among jurisdictions? A number of factors, in combination with each other, may explain the differences although we do not yet know their relative importance. Examples include demographics, geography, health status, the unit costs of care, and how services are organized and delivered.

Spending on Health as a Percentage of GDP 50

Total health expenditures as a percent of gross domestic product (GDP) are up since 1975, but the trends have fluctuated over time. This ratio is affected by both levels of health spending and GDP trends. In Canada, for example, from 1990 to 1993, the relatively large increase in health spending as a percent of GDP reflects in part flat growth in GDP over the same period. The graphs below show trends in health spending as a percent of GDP and GDP (adjusted for inflation) for Canada, the U.S., and Switzerland.



[View Data](#)

Source: Health Data 2003, OECD.

Demographics

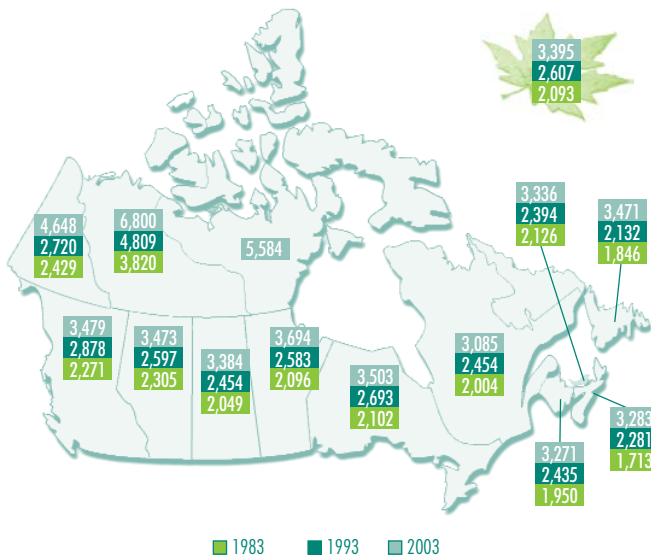
Health care needs usually dip after birth, then grow as people get older. A province with a young population would typically, all else being equal, have fewer health needs and in turn lower health care costs, than one with older residents. However, accounting for

a jurisdiction's age and sex only tells part of the story. For example, Alberta has a relatively young population, compared to Canada as a whole. The Alberta government's per capita spending in 1998 was 6% below the national average. When adjusted for the age and sex of Albertans, however, spending was actually 2% higher than the Canadian average.

Health Spending Across the Country

51

Per capita (per person) spending on health care, adjusted for inflation, has increased over time in all provinces and territories. All figures are in constant 1997 dollars.



Note: 2003 figures cited are forecasts.

Source: National Health Expenditure Database, CIHI.

Geography

When a province or territory is sparsely populated (that is, some patients are further from health services), more health care dollars may be put towards transportation costs. For example, almost 13% of health care dollars spent in the Northwest Territories goes towards medical transportation, compared to the national average of less than 2%.

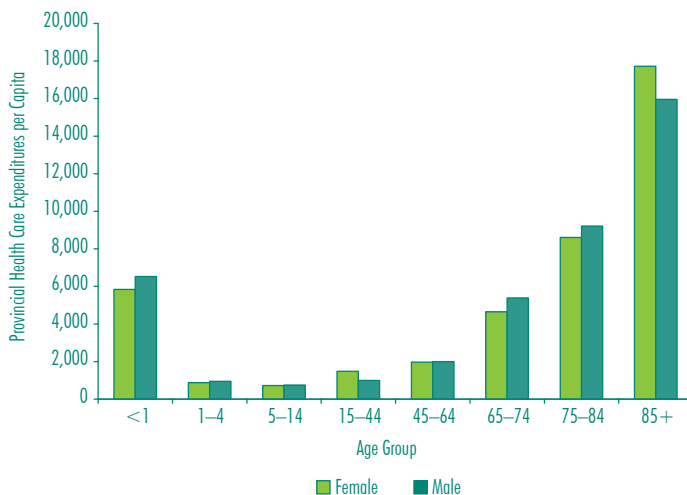
Determinants of Health and Health Status

The general health status of a population can also affect health spending. Higher rates of smoking, obesity, and excess alcohol consumption may create a need for greater spending on health care down the line. For example, obesity is one of the main risk factors for diabetes, which in turn may contribute to the need for kidney dialysis. In another example, populations with higher education and income levels are generally healthier and may use fewer (and different) health services.

Spending and Demographics

52

At different stages of our lives we have different health care needs. The graph below shows the estimated variation in provincial government per capita spending by age group in 2001.



[View Data](#)

Source: National Health Expenditure Database, CIHI.

The Price of Providing Care

All else being equal, differences in the cost of inputs to the system—such as wages, benefits, and supplies—may cause variations in health spending across the country. For instance, according to the Census, in 2000, average nurses' salaries ranged from a low of \$39,478 in New Brunswick to a high of \$60,943 in the Northwest Territories.

Variations in Drug Spending Across the Provinces

In 2003, 13% of *total* health care spending was for prescribed drugs, and this proportion is increasing over time.² According to a recent study, there was a 51% difference in per capita retail spending on oral solid prescription drugs across the provinces in 2002 (the territories were not included in the analysis).⁴ Researchers examined the impact of three variables on provincial health care spending: volume (number of prescriptions and duration); price (both cost of drugs and the use of lower-cost generic equivalents); and therapeutic choice (which specific drugs are prescribed). Volume had the greatest effect on interprovincial variations in spending, followed by prescribing patterns. Price had the smallest effect.

The Public/Private Spending Mix

The relative balance between public and private spending on health varies among the provinces and territories. The highest percentage of total spending associated with the public sector occurs for Nunavut (95%). For the private sector, Ontario has the largest percentage share, with 34% of total spending being financed by private sources. (See Chart 54 for more information on the public/private spending mix.) As well, there are variations in the range of services covered by provincial and territorial health budgets in areas such as home care, drugs, and rehabilitation services.

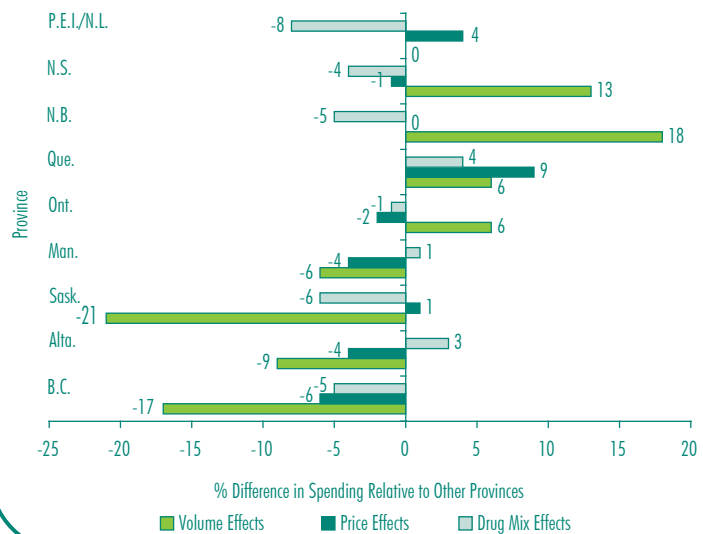
How Services Are Organized

There have been many changes over the years in the way we treat disease. Some procedures that used to require overnight stays in the hospital are now regularly being done as day surgery, thanks to new surgical techniques and other developments. For example, in 2000–2001 three-quarters (75%) of major hernia procedures were done as day surgery, compared to only half (52%) in 1995–1996. The nature and pace of change in day surgery and other areas has differed across the country, potentially affecting costs. A series of additional factors—such as caps on the volume of procedures and patterns of service delivery—may also contribute to variation in spending on health among the provinces and territories.

Why Does Spending on Drugs Vary?

53

Differences in the average number of prescriptions or the length of the course of treatment (volume effects) had the biggest influence on variations in per capita spending across the provinces, according to new research. Differences in the cost of drugs or the use of generics (price effects), and specific treatment choices or the mix of drugs prescribed (drug mix effects) had a smaller effect. For example, residents in New Brunswick used more prescription drugs per person when compared to the other provinces. All else being equal, this would have led to an 18% higher drug bill, but this volume effect was partly offset by the mix of drugs that was prescribed.



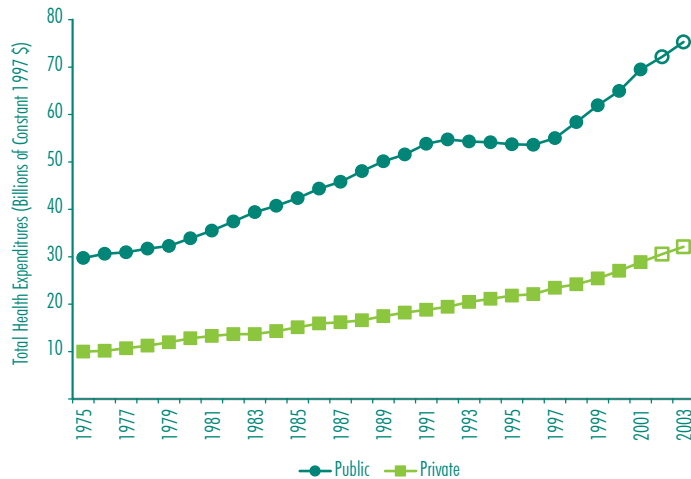
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Source: S. Morgan, "Sources of Variation in Provincial Drug Spending," *Canadian Medical Association Journal*, 170, 3 (2004), pp. 329–330.

The Public/Private Split in Spending

54

Since 1975, we have spent more on health care through the public sector than through the private sector. The public/private split has, however, fluctuated over time. For example, public-sector spending flattened between 1992 and 1997, as seen in the graph (in constant 1997 dollars).



Note: All 2002 and 2003 figures cited are forecasts.

[View Data](#)

Source: National Health Expenditure Database, CIHI.

Public and Private Financing of Health Care

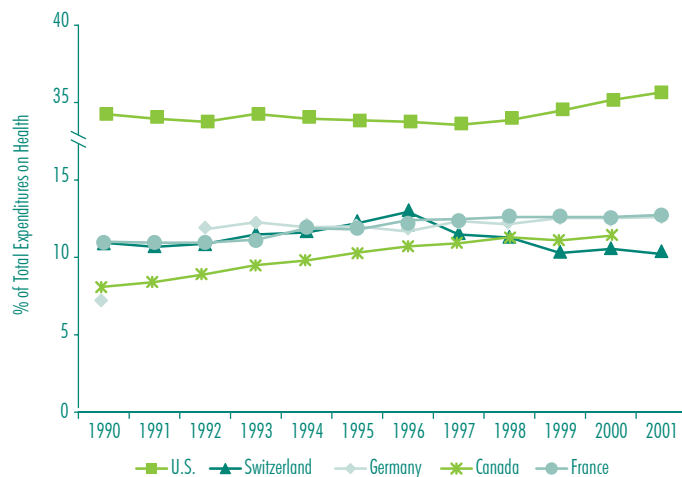
Funding for health care comes from two sources: the public and private sectors. As we have shown in past reports, their shares of total spending fluctuate over time (see Chart 54).

In 2003, seven out of every 10 dollars spent on health care came from the public purse. Governments and social security programs spent just over \$84.8 billion, up about 40% after inflation over a decade before. Public spending covers most public health programs, hospital care, physician services, and care for Status Indians and Inuit. The public sector also pays part of the cost of other services, such as home care, prescription drugs, and ambulances. The provinces and territories administer the bulk of the public-sector health budget, part of which is financed through federal transfers of cash and tax credits.

Financing Care: Private Insurance Share

55

Different countries finance health services in different ways. Over a third of U.S. health spending goes to private health insurance, compared to about 10% in Canada. The graph below shows the percentage spending on private insurance for the five OECD countries with the highest total spending on health as a percentage of GDP.



[View Data](#)

Source: Health Data 2003, OECD.

Medical Savings Accounts

Medical Savings Accounts (MSAs) are a hotly debated approach to funding health care, in Canada and elsewhere. Examples have been implemented in some countries, including the U.S. and Singapore.⁵

There are dozens of possible ways that MSAs could be implemented. Most models proposed for Canada see governments "depositing" annual entitlements to purchase health services in an MSA for each individual or family. The amount might be adjusted for factors such as age, sex, income, past health care use, and health status. In most proposed models, Canadians would be responsible for expenses beyond their annual entitlement up to a predetermined maximum (also known as the "catastrophic threshold"). Beyond the catastrophic threshold, private insurance companies or provincial governments would cover the costs. However, funds not used may be saved for future health care services. In other models, entitlements would be granted on a "use-it-or-lose-it" basis.⁶

Some people believe that MSAs would reduce health care costs by allowing patients to be more involved in their own care; others disagree suggesting that MSAs would mean higher expenses and place an unfair burden on those who fall ill.⁶

Spending on Drugs

In the 2003 Health Care Renewal Accord, First Ministers committed to ensuring reasonable access to drug coverage without undue financial hardship. Most public funding for prescribed drugs comes through provincial/territorial government health programs. Coverage under these programs varies across Canada, but all jurisdictions provide some benefits to seniors. As well, recipients of low-income assistance receive drug benefits in most jurisdictions. Our public sector spent a total of 9% of their health care expenditures on drugs in 2003, up from 6% a decade earlier. And drug's share of private spending is also up compared to 1993.

How does Canada's spending on drugs compare to the spending of other industrialized countries? We are among the top five OECD countries in terms of percentage of GDP spent on health care. While not as high as France, we do spend a higher proportion of our total health care expenditures on pharmaceuticals (including prescription, over-the-counter, and other medical supplies) than many other countries.

Compared to many other OECD countries, but not the U.S., Canada's public share of total health spending is smaller. In 2001, public funding accounted for 71% of total health care expenditures in Canada, 44% in the U.S., and about 85% in Denmark, Norway, and Sweden.^{3, 7}

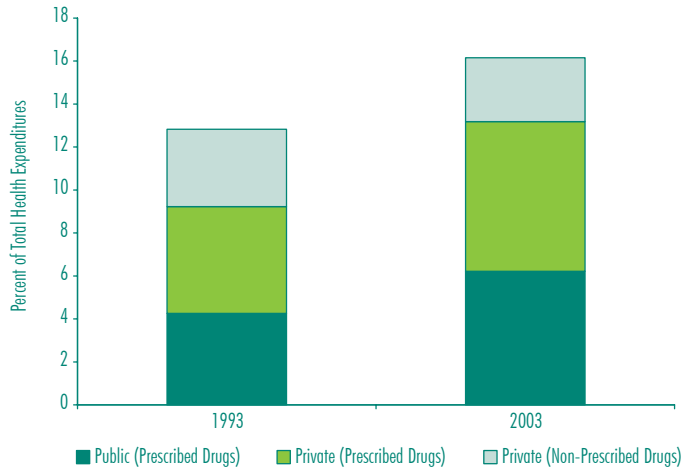
The other 29% of Canada's health spending was funded through the private sector. Overall, total private-sector spending rose by 57% after inflation in the decade leading to 2003. The percentage of total private-sector spending coming from private health insurance increased from 29% in 1988 to 40% in 2001. These funds generally support health services such as dental, eye, and chiropractic care, as well as drugs.

The out-of-pocket component typically includes items such as over-the-counter drugs and personal health supplies, fees, hospital expenditures (for a private room, for example), and residential care facility fees. Over the past decade, household out-of-pocket spending dropped from 58% to 50% of private sector spending. Non-consumption spending dropped from 13% to 9%.²

Changes in Drug Spending

56

Retail sales of prescribed drugs are up compared to a decade ago. Both the public and private sectors are spending more in this area. In contrast, the share of total health expenditures going to over-the-counter medications and other non-prescribed drugs is down.



Note: 2003 figures cited are forecasts.

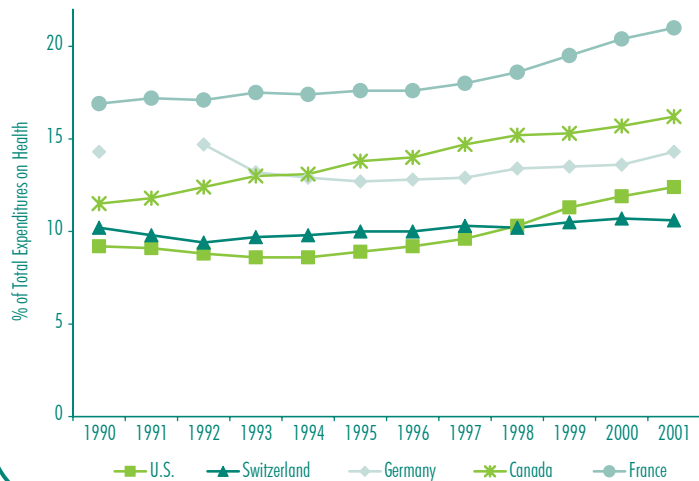
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Source: National Health Expenditure Database, CIHI.

Spending on Drugs: An International Comparison

57

When the five OECD countries that spend the highest proportion of their GDP on health care are compared, there is a range of spending on pharmaceuticals. France spends the highest share on prescription and over-the-counter drugs and other personal health supplies. Canada is in second place. The U.S. and Switzerland spend the least.



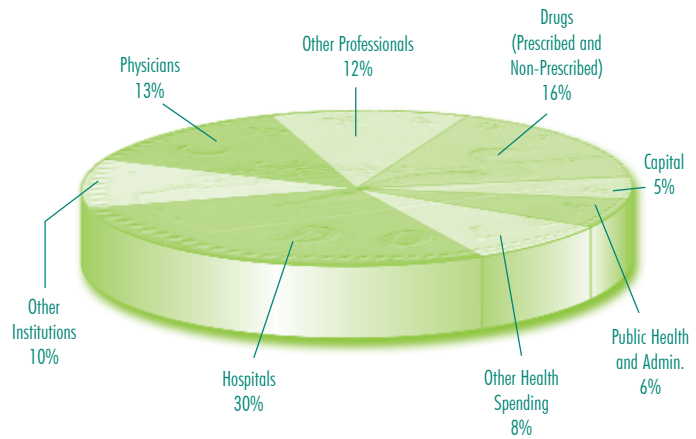
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Source: Health Data 2003, OECD.

Where Health Care Dollars Go

58

In 2003, a forecast \$121.4 billion was spent on our health care system, from both public and private sources. This chart shows how the money was spent.



Note: For specific definitions of the categories, see CIHI's *National Health Expenditure Trends 1975–2003*.

[View Data](#)

Source: National Health Expenditure Database, CIHI.

Future Health Spending: "The Age of Grey"

Will greying of the population bankrupt our health system? Dozens of articles, and perhaps even more speeches, have been written on the topic. Some say "yes." Others fiercely disagree.

What both sides *do* agree on is that average health spending is higher for older adults (see Chart 52). Some groups use this fact to project what would happen in the future if patterns of care stayed the same but the population aged. They typically find large increases in spending. For example, they assume that Canadians in the future would be equally as likely to access hospitals as they are today, and that they would be treated in the same way as current patients. Under these assumptions, projections show significant increases in acute care hospital use.⁸ For example, a recent Conference Board of Canada report stated that the expected rise in proportion of older Canadians will result in longer hospital stays, as well as more use of expensive drugs and other therapies, which could pose a threat to the sustainability of the health care system.⁹

Others point out that patterns of care are not the same now as in the past. For example, fewer Canadians stay in hospitals overnight now than in the past, and day surgery rates are rising. Why, then, should they be the same in the future, they ask? These groups argue that population aging *alone* doesn't necessarily mean higher spending if, for instance, people live longer and healthier lives. There is some evidence that this is happening. Life expectancy is rising, and Statistics Canada has shown that seniors are healthier now than in the past.¹⁰

A related argument is that people tend to experience a finite period of serious illness and disability at the end of life, regardless of how long they live. Under this theory, if people live to 90, they would not consume much more health care than those who die at 80.^{11, 12} Recent research from British Columbia goes further. It suggests that the costs of dying are inversely related to age. As a result, researchers argue that aging alone is likely to cause only relatively modest increases in spending, largely in the form of social and nursing care costs.¹³

Similarly, Canadian and international studies have shown that, in recent years, aging has had less of an impact on health expenditure trends than other factors.¹⁴ For example, total payments to fee-for-service physicians in British Columbia rose 86% between 1985–1986 and 1996–1997.¹⁵ Researchers found that general inflation and population growth alone explained 70% of this increase. Aging, in contrast, had little effect, accounting for 2% of the growth.

Likewise, studies from Canada and around the world have found that changes in how often people in specific age groups are hospitalized (and in their care during their stay) have been more important than overall population aging in explaining recent changes in hospital use.^{16, 17, 18, 19, 20}

Where Do Health Dollars Go?

Hospitals, drugs, and doctors' services account for the bulk of health spending. In 2003, hospitals accounted for the largest single component of total expenditures (30%), down from about 37% in 1993.

Retail drug sales made up the second largest category, at 16%, compared to 13% a decade earlier. This includes prescribed and non-prescribed drugs, as well as personal health supplies such as diabetic test strips. The largest share (13% of total health spending, up from 9% a decade earlier) is spent on prescribed drugs.

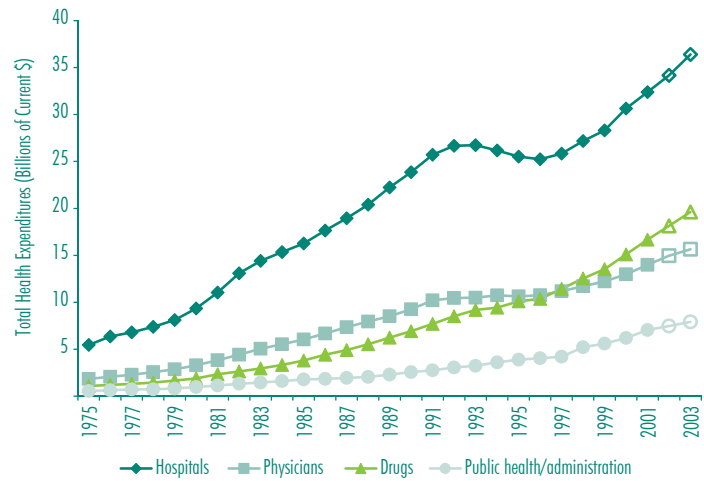
Individually, total spending on physicians (15% in 1993 and 13% in 2003) and other professionals (11% in 1993 and 12% in 2003) were smaller; but together they accounted for a combined total of 25%. These figures remain almost unchanged from 2001.

Different types of health services are financed differently. In 2003, hospitals (92%) and physician services (99%) were almost entirely publicly funded. Most (91%) of the services provided by other professionals working outside hospitals—such as dentists, private practice physiotherapists, and chiropractors—were privately financed, up from 86% in 1993. About 62% of retail drugs were privately financed, down from 67% a decade earlier.

Shifting Shares

59

How we spend the health care dollar changes over time. Hospitals have consistently accounted for the largest amount of spending, although their share of the total has been decreasing.



Note: 2002 and 2003 figures cited are forecasts.

[View Data](#)

Source: National Health Expenditure Database, CIHI.

Information Gaps: Some Examples

What We Know

- How health care spending has changed over time.
- How changes in spending over time differ from one part of the country to the other, and by category.
- How Canada's health spending compares internationally.

What We Don't Know

- What investments, either within the health sector or outside of it, would produce the largest overall health gains?
- How do changes in health care spending affect the health of Canadians?
- How do differences in private and public funding and service delivery affect costs, access, quality, and health outcomes of Canadians?
- To what extent do different factors (e.g. geography, population, health status, and wage differences) explain variations in health spending between jurisdictions?

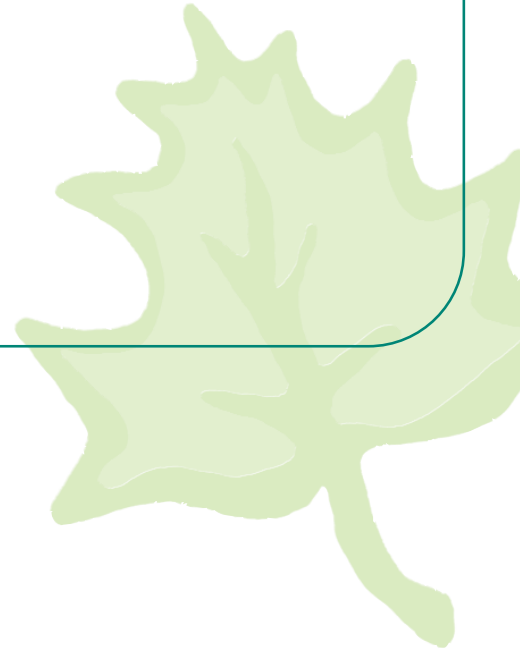
What's Happening

- CIHI released the latest version of the National Health Expenditure Trends series (1975–2003) in December 2003. It includes updated data on actual spending in 2001, as well as forecasts for 2002 and 2003.
- In 2002 and 2003, the Joint Canada/United States Survey of Health (JCUSH) surveyed Canadians and Americans about their health, their use of health care, and their functional limitations. They were also asked about their insurance coverage and socio-economic factors. The results of this survey, conducted by Statistics Canada and the National Center for Health Statistics, are expected in spring or summer 2004.
- Further analysis of the causes of variations in health spending and of the breakdown by type of spending is under way.
- As of April 1, 2004, funds in the Canada Health and Social Transfer were to be divided between the Canada Health Transfer (62%) and the Canada Social Transfer (38%). A \$2 billion addition to the fund will also be going solely to the Canada Health Transfer.

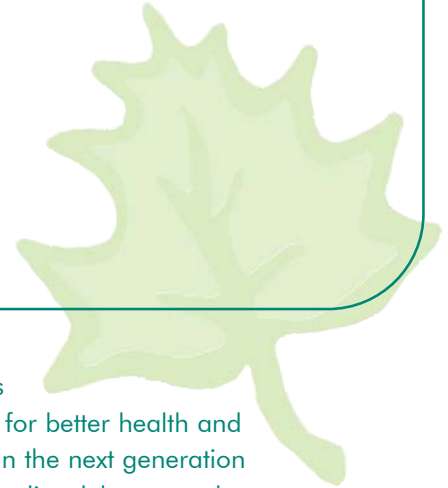
For More Information

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Conclusion



Conclusion



Health Care in Canada 2004 is our fifth annual report on the health of Canada's health care system. Evaluations show that previous reports have sparked local campaigns for better health and changes in how health care is delivered, been used to train the next generation of health professionals, informed provincial and national policy debates, and much more.

This year's report focuses on what we know and don't know about providing safe care. We present new data and summarize the results of some of the most compelling Canadian and international studies on patient safety. Specific results and methods differ, but we found common themes across most countries. The good news is that patient safety in Canada appears to be about the same as in other developed countries. That said, preventable adverse events are clearly an important challenge worldwide.

The best news is that many adverse events can be prevented. Common challenges have bred creative solutions in many countries. This report highlights some of the strategies that have been put in place or suggested to prevent adverse events from happening or to minimize their consequences. Some of these strategies show considerable promise. The report showcases examples of success stories, where changing care practices or policies have contributed to substantial reductions in adverse events. These changes have occurred in the context of how Canadians and health care providers perceive and deal with adverse events when they happen, including cultural views about open and closed systems.

As always, we have also included updated information about the people who provide care and the dollars it takes to do so. And, as we put the final touches on this report, we are already planning for the next. What our focused content will be next year is up for discussion. We are asking you, our readers, what you recommend. We encourage you to complete the "It's Your Turn" feedback form (at the end of this report or on-line at www.cihi.ca). We will also be guided by Listening for Directions II, the latest round of pan-Canadian consultations on priority research and information needs conducted by CIHI and four other organizations early in 2004.

Listening for Directions II

In 2001, a national consultation process was undertaken to determine the research priority themes in health services and policy research. Since then, lead organizations have been identified to facilitate research related to the themes that emerged. The Canadian Health Services Research Foundation, for example, was identified as the lead agency for research on the theme of *health human resources* and has made a long-term commitment to fund research projects and programs related to this theme. Similarly, the Institute for Health Services and Policy Research, along with CIHI, is taking the lead on the theme of *improving quality*. To this end, CIHI is leading a major project to develop and implement systems for monitoring and reporting on preventable adverse effects of care. Through lead organizations, projects for many of the other themes and priorities have also been initiated over the last three years.

In early 2004, the national consultation process was repeated with similar, but somewhat expanded, objectives:

- Over the next six to 24 months, uncover priority issues for which related synthesis themes or questions could be developed.
- For the next two to five years, uncover emerging priority issues for which related research and synthesis themes or questions could be designed.
- Over the next two to five years, assess the continued relevance of the priority research themes identified in Listening for Direction I to ensure that they continue to reflect priority issues likely to confront policy makers and managers in the health care system.
- Translate previous priority areas into synthesis and research themes, where relevant.

Through this process, 10 research themes emerged. Under each of these themes lie key synthesis questions to be addressed in the short term (six to 24 months) and illustrative questions to be addressed in the longer term (two to five years).

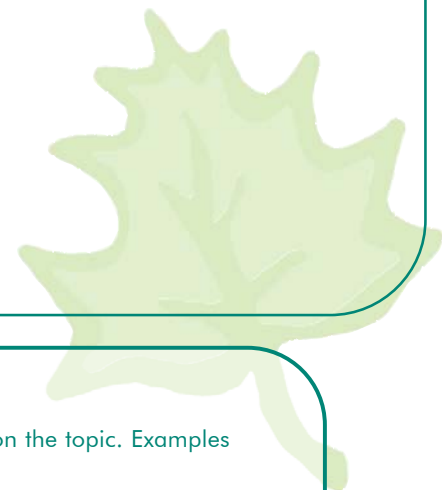
The next steps in the process include drafting, validating, and finalizing the Listening for Directions II report. The final phase, to begin in fall 2004, will consist of implementing follow-up procedures to ensure the report is reflecting researchers' and decision makers' needs.

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Research Themes	
1	Workforce planning, training, and regulation
2	Management of the health care workplace
3	Timely access to quality care for all
4	Managing for quality and safety
5	Understanding and responding to public expectations
6	Sustainable funding and ethical resource allocation
7	Governance and accountability
8	Managing and adapting to change
9	Linking care across place, time, and settings
10	Linking public health to health services

Source : Canadian Health Services Research Foundation, 2004

Appendix



A Look at Patient Safety Reports

As patient safety moves into the spotlight, various groups have produced policy reports on the topic. Examples from a selection of countries are highlighted below.

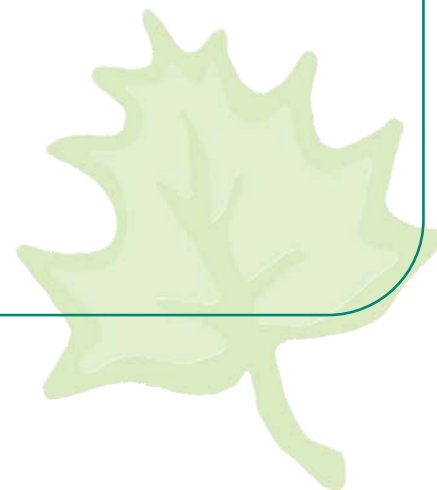
Report	Country	Year	Description	Highlights
<i>Guidelines to the Practice of Anesthesia</i> ^{1,2}	Canada	1975 (latest version 2004)	Published by the Canadian Anesthesiologists' Society (CAS).	Guidelines reviewed annually and revised periodically in an effort to ensure the safe delivery of anaesthetic services.
<i>Quality of Australian Health Care Study</i> ³	Australia	1995	Commissioned report released by the Commonwealth Department of Health examining the extent of adverse events in Australian hospitals.	Data revealed that 16.6% of admissions had adverse events, of which 51% were deemed preventable. In 77.1% of the cases, the disability of the patient had been resolved within 12 months, in 13.7% the disability was permanent, and in 4.9% of cases the patient died.
<i>To Err Is Human: Building a Safer Health System</i> ⁴	U.S.	2000	Published by the Institute of Medicine (IOM).	The authors estimated that there were between 44,000 and 98,000 deaths annually in hospitals as a result of adverse events and that 7,000 were from medication errors alone. It was also found that adverse events cost the U.S. \$37.6 billion each year.
<i>Doing What Counts for Patient Safety: Federal Actions to Reduce Medical Errors and Their Impact</i> ⁵	U.S.	2000	Response to <i>To Err Is Human</i> , released by the Quality Interagency Coordination Task Force (QuIC).	Provides an inventory of ongoing federal actions to reduce adverse events and recommendations for more than 100 actions to be undertaken by federal agencies.
<i>Safety First: Report to the Australian Health Ministers' Conference</i> ⁶	Australia	2000	First report released by the Australian Council for Safety and Quality of Health Care.	Commitment by the Council to the development of a national strategy which will include an environmental scan of current safety/quality initiatives to identify partnerships and other opportunities, as well as the development of standards and compliance mechanisms in priority areas where they do not exist.
<i>An Organization with a Memory: Report of an Expert Group on Learning from Adverse Events in the NHS</i> ⁷	U.K.	2000	Report released by the National Health Service (NHS).	Authors reported that at least 400 patients died or were seriously injured and that close to 10,000 people reported having experienced serious adverse reactions to drugs (not all of which were preventable) in 1999. It was also estimated that adverse events occur in approximately 10% of patient admissions in the U.K.
<i>Making Health Care Safer: A Critical Analysis of Patient Safety Practices</i> ⁸	U.S.	2001	Report released by the Agency for Healthcare Research and Quality (AHRQ).	This report rated the evidence on a wide range of practices for improving patient safety.

A Look at Patient Safety Reports (cont'd)

Report	Country	Year	Description	Highlights
<i>Crossing the Quality Chasm: A New Health System for the 21st Century</i> ⁹	U.S.	2001	Report released by the Committee on the Quality of Health Care in America for the Institute of Medicine as a companion to <i>To Err Is Human</i> .	The authors argue that use of a computerized medication order entry (CMOE) system could significantly reduce errors in drug prescribing and dosages. They concluded that a nation-wide effort is required to build a technology-based information infrastructure that would lead to the elimination of most handwritten clinical data in the next 10 years.
<i>Review of Processes Concerning Adverse Medical Events</i> ¹⁰	New Zealand	2001	Report by Helen Cull, Q.C. for the Ministry of Health.	The author observed that 14 different organizations could potentially be involved in investigating adverse medical events and concluded that there was no streamlined approach to complaint mechanisms, no agency interaction or co-ordination to enable the disclosure of relevant information, and no centralized database to detect repeated occurrences of poor practice. It was recommended that a one-stop shopping approach to the complaint process be established.
<i>Patient Safety and Healthcare Error in the Canadian Healthcare System. A Systematic Review and Analysis of Leading Practices in Canada with Reference to Key Initiatives Elsewhere</i> ¹¹	Canada	2002	Report commissioned by Health Canada.	Both telephone and mail surveys identified barriers and opportunities for improving patient safety in Canada.
<i>Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Health Care</i> ¹²	Canada	2002	Report released by the National Steering Committee on Patient Safety (NSCPS).	One of the key recommendations was the establishment of a Canadian Patient Safety Institute (CPSI), designed to promote innovative solutions and to facilitate collaboration among governments and stakeholders to enhance patient safety.
<i>Quality of Care: Patient Safety</i> ¹³	International	2002	Report by the World Health Organization Secretariat to the 55th World Health Assembly.	Reviewed patient safety issues, extent of adverse events, their nature, and strategies to enhance the safety of patients.

- Sources:** 1. Canadian Anesthesiologists' Society, "History of the CAS," 2004 [on-line], from <www.cas.ca/public/history>.
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| Clarity | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |
| Organization/Format | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |
| Use of charts | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |
| Quality of analysis | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |
| Level of detail presented | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |
| Length of the report | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |

Usefulness of the Report

4. Please indicate how useful you found each of the following sections of the report by putting an "X" in the most appropriate category:

- | | | | | |
|---|--------------------------------------|--|-------------------------------------|---------------------------------------|
| A Year in the Life of Canada's Health Care System | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| Making Health Care Safer | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| Patient Safety—A Worldwide Challenge | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| To Err Is Human . . . in Canada Too | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| Preventing the Preventable | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| Providing and Experiencing Care | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| The Cost of Health Care | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |
| Health Indicators 2004 | <input type="checkbox"/> Very useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Not useful | <input type="checkbox"/> Did not read |

5. How do you plan on using the information presented in this report?

6. What did you find most useful about this report?

7. How would you improve this report? Do you have any suggestions for future reports?



Reader Information

8. Where do you live?

- | | |
|--|--|
| <input type="checkbox"/> Newfoundland and Labrador | <input type="checkbox"/> Saskatchewan |
| <input type="checkbox"/> Nova Scotia | <input type="checkbox"/> Alberta |
| <input type="checkbox"/> New Brunswick | <input type="checkbox"/> British Columbia |
| <input type="checkbox"/> Prince Edward Island | <input type="checkbox"/> Northwest Territories |
| <input type="checkbox"/> Quebec | <input type="checkbox"/> Yukon Territory |
| <input type="checkbox"/> Ontario | <input type="checkbox"/> Nunavut |
| <input type="checkbox"/> Manitoba | <input type="checkbox"/> Outside Canada (please specify country) _____ |

9. What is your main position or role?

- Health services manager or administrator
- Researcher
- Policy analyst
- Board member
- Elected official
- Health care provider
- Student
- Educator
- Other (please specify) _____

Thank you for completing and returning this questionnaire.

ten
years  **dix**
ans

taking health information further
à l'avant-garde de l'information sur la santé