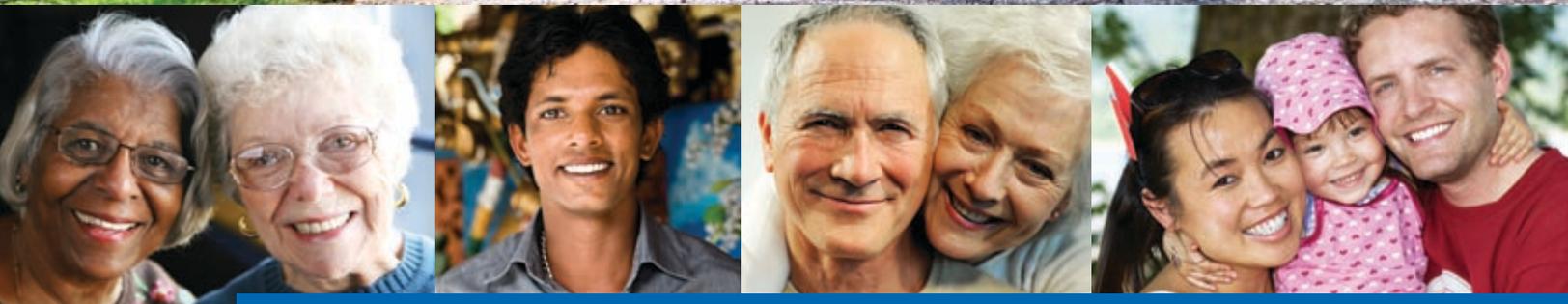


Cancer Control in Canada: 2007

A Baseline Report



A broad and dedicated group of more than 700 cancer organizations, experts, patients and survivors worked for nearly a decade to develop the Canadian Strategy for Cancer Control. These leaders who developed the strategy recognized the need for a central national organization to coordinate the many facets of cancer control across the country and in November of 2006 the government of Canada announced funding for The Canadian Partnership Against Cancer. In April of 2007, the Canadian Partnership Against Cancer began operations as an independent non-profit organization with a five year mandate to oversee the implementation of the Canadian Strategy for Cancer Control.

This report, *Cancer Control in Canada: 2007 - A Baseline Report* serves as a baseline of the state of Canadian cancer prevention, screening, diagnosis and treatment efforts in the spring of 2007, at the time the Canadian Partnership Against Cancer was formed. As well, it provides information about the challenges faced, the required framework for an effective cancer control system and the need for integration and collaboration.

Cancer Control in Canada: 2007 - A Baseline Report highlights the available information about the characteristics, factors or processes of care that relate to cancer through a synthesis of data from various Canadian sources (see Notes). The document follows a report, *Progress Report on Cancer Control in Canada*, developed by Health Canada in 2004.¹

The project team responsible for the development of the report was led by:
Dr. Heather Bryant, Vice President, Cancer Control, the Canadian Partnership Against Cancer

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The views expressed herein represent the views of the Canadian Partnership Against Cancer.

The Canadian Partnership Against Cancer would like to acknowledge and thank the many individuals and organizations that have contributed to the development of this report.

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INTRODUCTION:

Canada's Cancer Control Strategy

DID YOU KNOW?

Cancer is a disease that affects most Canadians in one way or another. Cancer refers to a group of diseases that can occur in almost any site in the body and can spread. Cancer has an adverse impact on the lives of many Canadians.

“A well-conceived, well-managed national cancer control programme lowers cancer incidence and improves the lives of cancer patients, no matter what resource constraints a country faces.”²

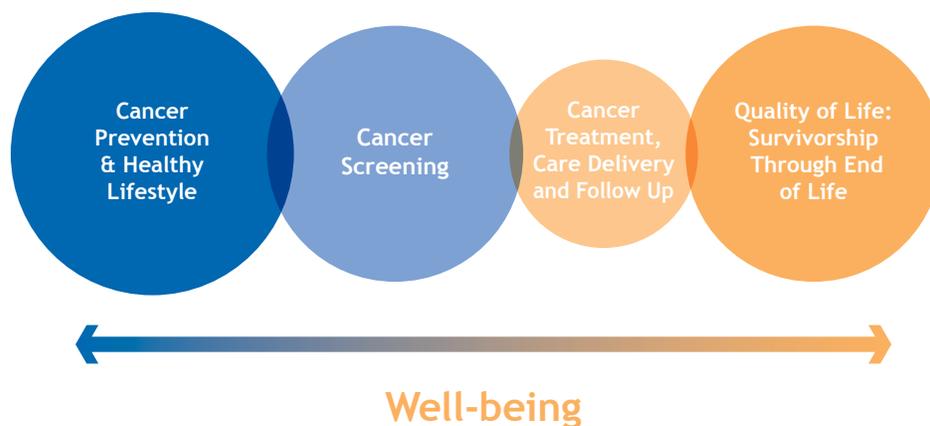
Since 2002, the World Health Organization has urged countries to develop national **cancer control** programs as the best means to reduce the incidence and impact of cancer and improve the quality of life for those with this disease. Canada has a national cancer control strategy,³ released in July 2006, with the goals of:

- *reducing the number of Canadians diagnosed with cancer;*
- *enhancing the quality of life of those living with cancer; and*
- *lessening the likelihood of dying from cancer.*

This report serves as a source of information about the Canadian cancer control landscape in 2007 and the initial stages of implementing Canada's strategy to control cancer. As such, it provides a baseline against which progress can be measured since 2007, when the strategy was funded, and over the coming years.

Cancer control takes an approach to cancer that goes beyond caring for those already diagnosed with cancer and receiving treatment to the whole population. This means that cancer control involves people and groups of people who are well, in addition to those with cancer. It can be seen as a continuum that encompasses cancer prevention, including healthy lifestyle and healthy environments, screening for early detection of cancer, treatment for cancer and survivorship or end-of-life care. A comprehensive cancer control strategy combines all of these elements in a coordinated approach that includes all partners: policy-makers, health professionals, researchers, patients and the community at large.

This approach ensures that the well-being of the population, whether healthy or part of the cancer care system, remains the focus of the effort.



Note: Adapted from Pennsylvania Comprehensive Cancer Control Plan, 2003.

A Snapshot of Cancer in Canada



This chapter provides an overall picture of cancer in Canada, as it was known in 2007. The first part of the chapter provides the main highlights for Canada and for specific cancer sites, followed by a more detailed exploration of cancer and the many ways in which the disease impacts Canadians. In April of 2007, the most recent data available were from 2003.

In 2003, more Canadians were living with cancer than ever before in the nation's history. Cancer touches people of all ages but the majority of Canadians diagnosed with cancer were over the age of 55. As Canada's population increases and ages, cancer will continue to exact a growing toll on the country, its citizens and its healthcare system. **Invasive cancers** were the leading cause of death in Canada, with lung cancer remaining the leading cause of cancer death for men and women in 2003. Based on the information available in 2007, it was projected that about 39% of Canadian women and 44% of Canadian men would develop cancer during their lifetime and approximately one of every four Canadians would die from cancer.

DID YOU KNOW?

Over the next 30 years, it is estimated that nearly six million Canadians will develop cancer and some three million will die of the disease.³

Overall Highlights

- In 2003, the most recent year for which data were available, 143,466 Canadians were diagnosed with cancer and 65,990 people in Canada died from cancer.
- Over 55% of all cancer deaths in 2003 were associated with cancers located in one of five sites: lung, colorectal, female breast, male prostate and pancreas.
- The most common cancers for Canadian males diagnosed in 2003 were prostate, lung and colorectal cancer.
- The most common cancers for Canadian females diagnosed in 2003 were breast, lung and colorectal cancer, with breast cancer occurring more than twice as often as the other two cancers.
- Breast cancer accounted for 30% of cancer incidence in Canadian females.
- Lung cancer continued to be the leading cause of cancer death in men (10,200 deaths in 2003) and women (7,200 deaths in 2003).
- Colorectal cancer was the second leading cause of cancer death, for both sexes combined, in Canada (8,100 deaths in 2003).

DID YOU KNOW?

Cancer is not just one disease. There are more than 200 different types of cancer, each with its own pathway of diagnosis and treatment.

The Overall Picture of Cancer in Canada

Understanding the **incidence** and **mortality** associated with cancer gives us some of the information we need to understand the overall picture of cancer in Canada. There are various kinds of information in this report about:

- *patterns in prevention, screening, clinical treatment of patients and their support;*
- *various initiatives that were underway to advance cancer control; and*
- *data and various cancer registries, and the quality or completeness of this data.*

There is a time lag between when data are collected and when they become available. Therefore, in 2007 the majority of data available for analysis were collected in 2003 and in a few instances, 2005 and 2006.

Data and Surveillance

Information about cancer cases and deaths is captured through various mechanisms. Public health **surveillance** refers to the systematic collection, analysis, interpretation and dissemination of timely, complete and accurate information on the population(s) of interest. Surveillance systems often use population- or patient-based registries

that serve as naturalistic tools, allowing the analysis and assessment of the natural course of a disease, a population or treatment or intervention and how any of these evolve over time.

Cancer surveillance provides the foundation for a national strategy to reduce the number of people diagnosed with cancer and the number of deaths resulting from cancer by providing a mechanism to improve the understanding of the disease. A solid surveillance system plays a unique role in advancing cancer control by determining patterns of cancer among various populations and monitoring trends over time.

Surveillance data allow reporting of cancer patterns by age, sex or province for example. This information is important because it provides knowledge about groups of individuals (populations) developing or dying from cancer. The information gathered forms a body of sound evidence that can lead to the generation of **hypotheses**. The resulting information can then inform clinical, policy and system dialogue and decisions. Robust surveillance information prompts action at all levels from the national through to the individual, as the available data are applied to cancer control activities along the continuum.

Patterns in Cancer; Trends Over Time

When information is presented about incidence and mortality over time, this allows the calculation of average annual change, which in turn allows the identification of trends and areas of concern or areas where improvements have occurred. This helps in appropriately planning strategies to build on positive trends and to address concerns. The identification of trends also helps decision makers to plan appropriately so that the healthcare system is prepared for any expected changes.

Age-standardized rates are often used to examine incidence and mortality because they allow com-

parisons by accounting for different age distributions in populations. This is necessary because the chance of being diagnosed with cancer increases with age, particularly after age 55. For this report, the rates are age standardized to the Canadian population in 1991. In the case of cancer, age-standardized rates are particularly important because age has such a powerful influence on the risk of cancer.

The age-standardized rate of new cases (incidence rate) of cancer being diagnosed in Canada remained stable between 1992 and 2003. During the same timeframe the mortality rate gradually decreased (Figure 1).

FIGURE 1
Age-standardized incidence and mortality rates for all cancers, Canada, 1992 to 2003



Sources: Statistics Canada, Public Health Agency of Canada.

DID YOU KNOW?

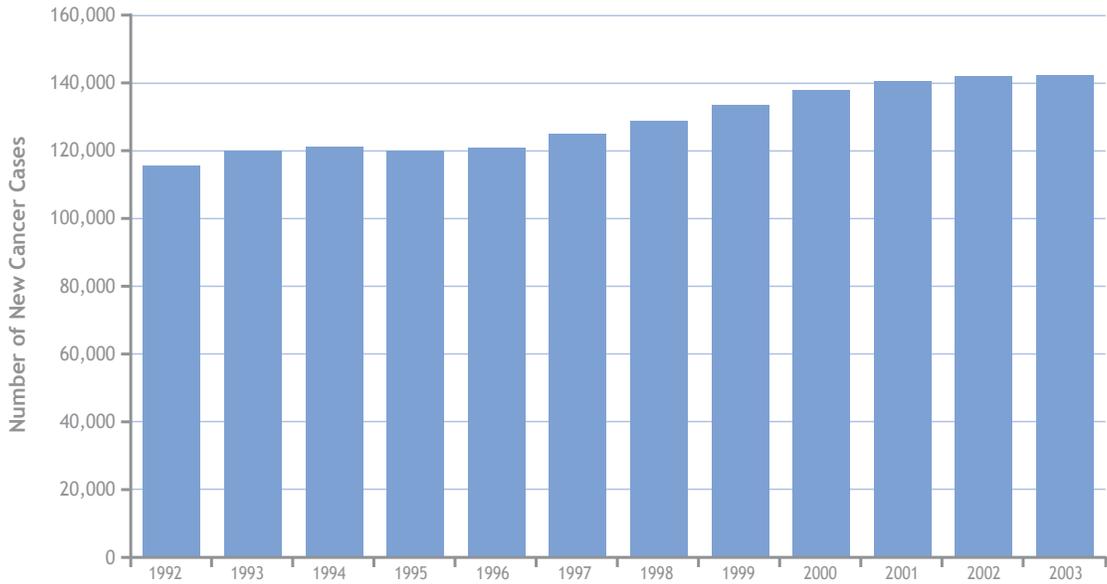
On average, two Canadians were diagnosed with cancer every seven minutes. Every seven and a half minutes one Canadian died from cancer.³

The number of new cancer cases increased in Canada (120,000 in 1992 to 140,000 in 2003), mainly due to population growth and the fact that more Canadians were in older age groups as the decade progressed (Figure 2).

There were similarities and differences between males and females and their experience with cancer. Figure 3 shows the age-standardized rate for the three most common cancers seen in men in Canada (prostate, lung and colorectal cancer). For Canadian men, between 1992 and 2003, the

incidence of lung cancer had shown a 2.2% annual decrease, with a corresponding 1.1% annual decrease in mortality for the disease. While prostate cancer is relatively common in men, it is less often a cause of death than either lung or colorectal cancer (Figure 4). Prostate cancer is most often diagnosed in older men, who may have other life-altering diseases at the same time. This combined with the fact that prostate cancer is relatively slow growing (less aggressive than other tumours) means that men are less likely to die because of prostate cancer.

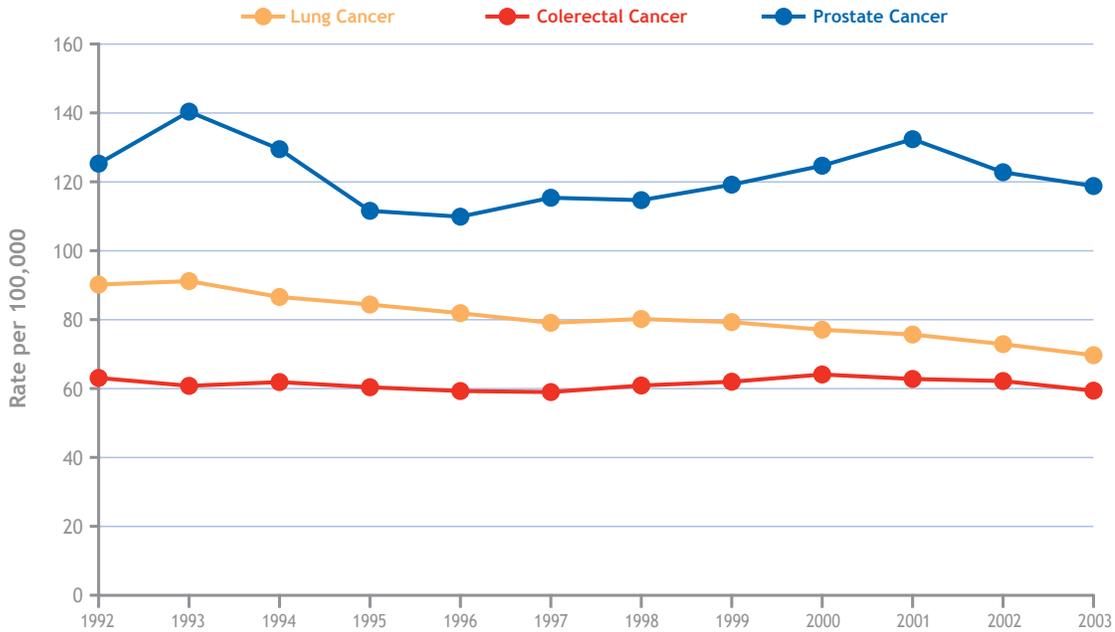
FIGURE 2
Number of new cases for all cancers, 1992 to 2003



Source: Statistics Canada.

FIGURE 3

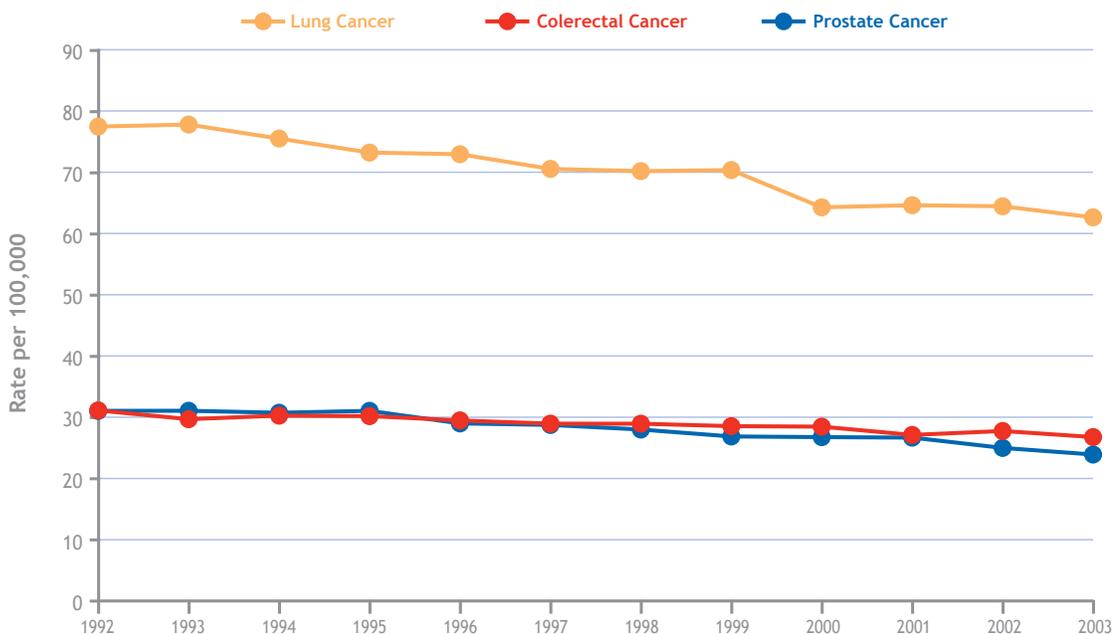
Age-standardized incidence rates for lung, prostate, and colorectal cancer, males, Canada, 1992 to 2003



Source: Statistics Canada, Public Health Agency of Canada. Cancer Surveillance Online.

FIGURE 4

Age-standardized mortality rates for lung, prostate, and colorectal cancer, males, Canada, 1992 to 2003



Sources: Statistics Canada, Public Health Agency of Canada. Cancer Surveillance Online.

DID YOU KNOW?

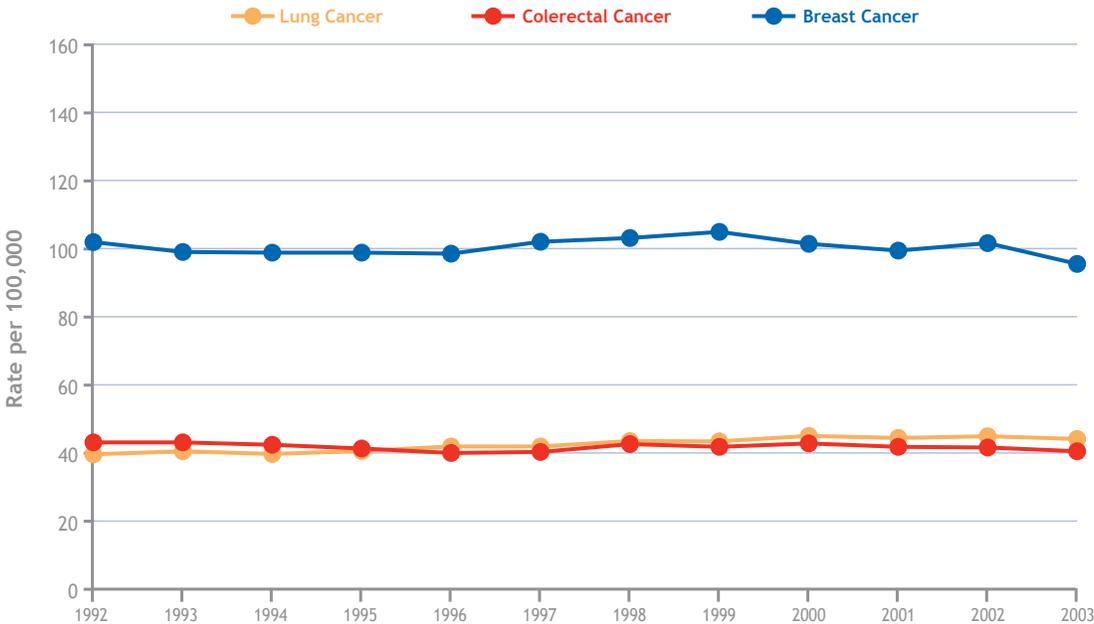
Among Canadians 35 and 64 years of age, cancer is the leading cause of death, causing more mortality than heart disease, stroke, infectious diseases, trauma and suicide combined.

The most common cancers in females in Canada were breast, lung and colorectal cancer, and the rates of these three cancers were fairly stable throughout the decade spanning 1992 to 2003 (Figure 5). Incidence rates for breast cancer increased steadily until 1999 when they stabilized. Incidence rates for lung cancer increased for females between 1992 and 2003 (1.96% annual increase).

Mortality trends for females with cancer in Canada were different than those for men, with lung cancer deaths increasing for women (1.91% annual increase) and deaths due to breast cancer decreasing with a 2.1% annual decrease between 1992 and 2003 (Figure 6).

Cancer is an important issue for all Canadians and affects many Canadians during the entire lifespan, from childhood through their adult working years and older years. The impact of cancer on Canadians is far reaching, beyond individuals and their families to the wider community. Death from cancer continued to be a major problem in all age groups. The information available in 2007 showed that cancer was the leading cause of death for Canadians aged 35 to 64. Cancer accounted for more deaths in this age group (43%) than heart disease, injury, suicide, stroke, and infection combined (Figure 7).

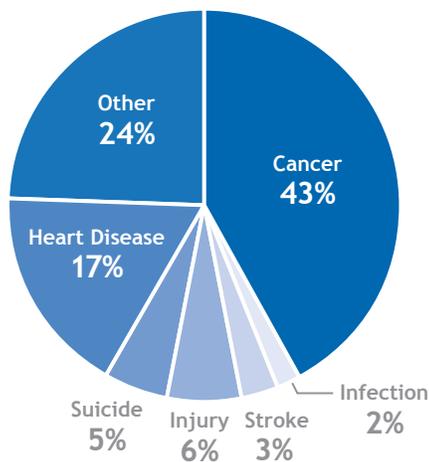
FIGURE 5
Age-standardized incidence rates for breast, colorectal, and lung cancer, females, Canada, 1992 to 2003



Sources: Statistics Canada, Public Health Agency of Canada. Cancer Surveillance Online.

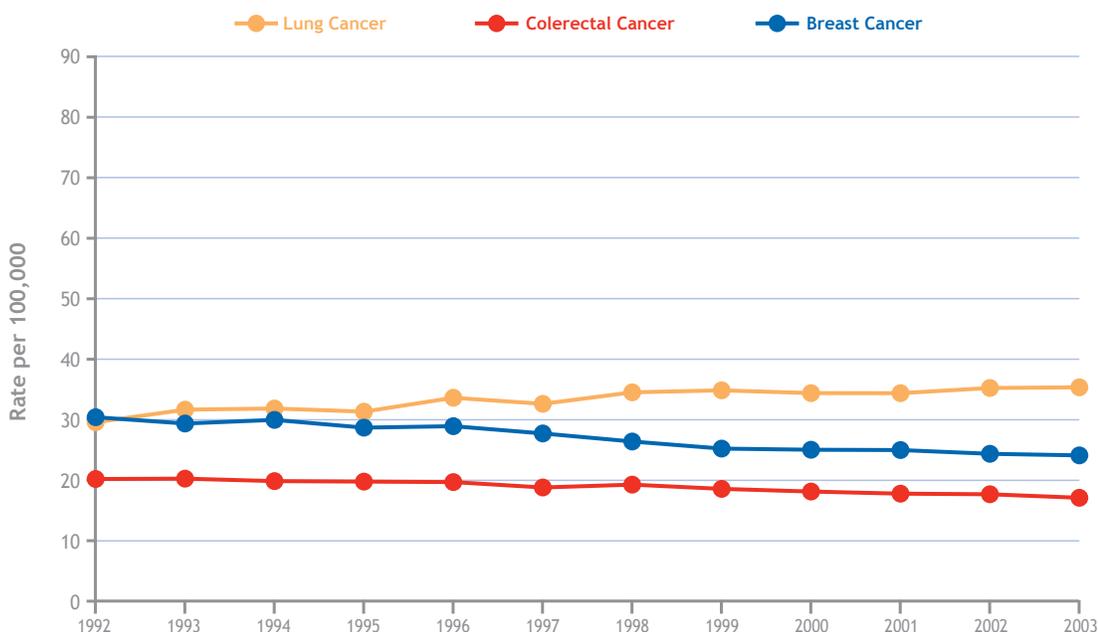
Differences were observed in the incidence and mortality rates associated with cancer across the various regions of Canada, with a tendency for higher rates for both incidence and mortality in the eastern part of the country compared to the western part (Figure 8). The regional differences seen may be due to a variety of factors that either acted alone or in combination. These factors include differences in diagnostic activity or cancer **screening**, differences in the success of prevention efforts or in risk factors (e.g., smoking, unhealthy weights, unhealthy environments), or differences in the population characteristics in a particular region.

FIGURE 7
All causes of death in Canada, ages 35 to 64



Source: Statistics Canada. Vital Statistics.

FIGURE 6
Age-standardized mortality rates for breast, colorectal, and lung cancer, females, Canada, 1992 to 2003

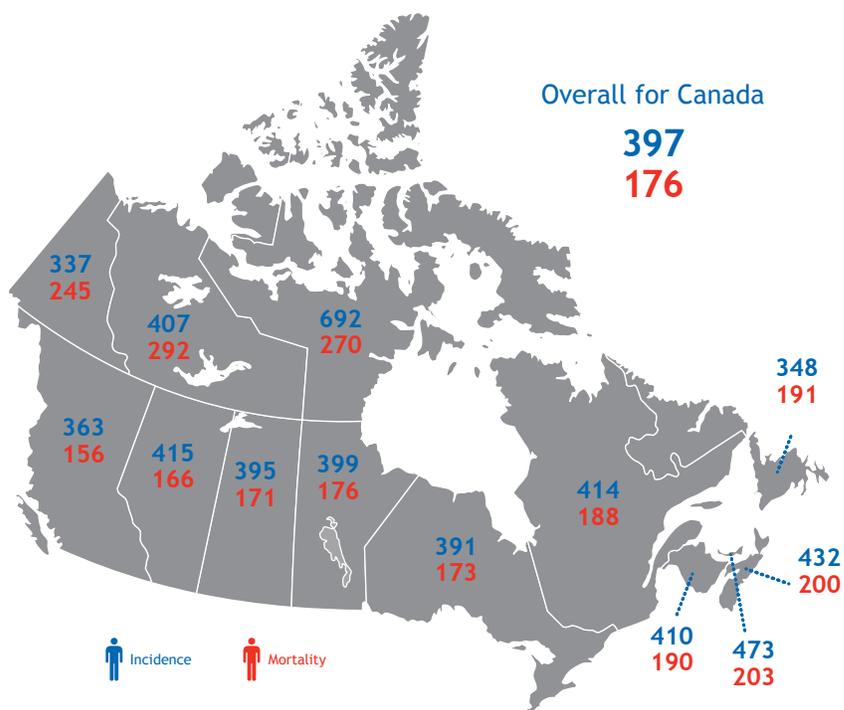


Sources: Statistics Canada, Public Health Agency of Canada. Cancer Surveillance Online.

It is not surprising that access to cancer care, specifically wait times is often the focus of intense interest and public debate. In an ideal world, this debate would be based on solid information so that informed decisions could follow. In 2007, while the topic was often discussed, there were not consistent, complete or timely data available about how long patients waited for different types of cancer care, or how these waits had changed over time. The challenges of measuring wait times were documented in 2005, along with the conclusion that wait times impacted patients' health.⁴ By 2007, the complexity of the issue had been

realized and it was understood that the extent to which waiting impacted a person depended on a wide range of factors that differ between individuals and diseases. Cancer is not a single disease, and the effect of waiting may present different risks depending on the type of cancer, the stage of the disease at **diagnosis**, the aggressiveness of the cancer and the person's social or personal situation. Information about the time patients waited for cancer care was beginning to be examined in 2007. However, Canada was far from the vision of having good information about access to care for all parts of the patient's journey, through the cancer continuum, and across the nation.

FIGURE 8
Age-standardized incidence and mortality rates, all cancers, Canada, 2003 (per 100,000 population)



Source: Public Health Agency of Canada, Cancer Surveillance On-line.



The Burden of Cancer in Canada

The burden of a disease on individuals and the Canadian economy includes more than the direct costs associated with providing healthcare but also encompasses indirect costs that include the loss of productivity at work related to an illness, and costs to family members to be available for the person who is ill. The overall burden of a disease includes these factors plus the **potential years of life lost (PYLL)** because of that disease.

In 2007, the most recent analysis available on the economic impact of cancer in Canada was from 1998. The 1998 analysis showed cancer to be the third-most costly disease in Canada (after cardiovascular diseases and musculoskeletal diseases) in terms of direct and indirect dollar costs. Cancer in Canada accounted for costs of \$14.2 billion in 1998. Of this, approximately 18% of the costs were direct costs (e.g., hospitalization and medication), while the remainder were for indirect costs such as

those associated with early death or disability. The \$14.2 billion spent on cancer accounted for 8.9% of the total economic burden of all illness in Canada.

In Canada, the largest overall burden of disease (dollar costs and potential years of life lost) was attributable to cancer, mainly because it was the leading cause of premature death. Premature death from cancer occurs most often in those cancers that have the highest incidence, have an earlier age of onset and with a more rapid progression to death. PYLL provides an understanding of the impact of a disease (in this case cancer) on the population; this measurement is calculated by subtracting the age when a person dies from the life expectancy of that person based on the **life tables**. In 2007, it was estimated that over the following 30 years, more than 38 million potential years of life would be lost in Canada due to premature death from cancer. The year 2003 marked the first time in Canadian history that cancer was estimated to be responsible for more than one million years of life lost in one year.



The **prevalence** of a disease refers to the number of people who are currently living with that disease. For cancer in Canada, that number has grown every year. Increasing cancer prevalence is important in two key ways. The first of these is the positive news that more people with cancer are surviving. The second, resulting from improved survival rates, is that the chances of recurrence and further treatment many years after the initial diagnosis are increased. This has an effect on patients, their families and the healthcare system and as such is an important aspect of the burden of cancer in Canada.

Changes in the size of the Canadian population and the age structure of Canadian society, along with increased prevalence rates were the major determinants in the increasing burden of cancer in Canada, although there was a relatively stable rate of new cancers being diagnosed. Clearly, the personal and economic costs associated with cancer were high.

The Canadian Strategy for Cancer Control recognized that if the comprehensive strategy that had been developed was funded and organized as a coordinated national effort it would not only benefit individual Canadians, but would save billions in health care costs, government tax revenues, and wage based productivity.

Controlling Cancer in Canada



Incidence and mortality can both be affected by prevention and screening while prevalence and mortality can be affected by diagnosis and treatment. Supportive care of patients and their families affects overall well-being. The following sections discuss why each of these components is important to cancer control and what the situation was in Canada in 2007.

In 2007, there were many agencies, organizations and individuals focused on controlling cancer in Canada so that the burden of the disease could be reduced for individuals, their families, communities and Canadian society overall. While much had been done in Canada by 2007, the development of the Canadian Strategy for Cancer Control pointed to the fact that the efforts were scattered and isolated, therefore lacking leverage. In 2007, the goal of controlling cancer was seen to be achievable through prevention, screening, treatment and research. The evidence showed that more than half of all cancers could either be prevented or detected early enough to be treated successfully.⁵

Primary Prevention

Preventing cancer from developing in the first place is one of the approaches that can be used to reach the goals of Canada's cancer control strategy of reducing cancer incidence and mortality. Depending on the prevention approach, there may be a considerable lag time between the beginning of a prevention initiative and a change in cancer incidence or mortality. Primary prevention of cancer means either removing a person's or group's exposure to risk factors that can cause cancer or improving the ability of the body to resist cancer. Modifiable risk factors include such things as tobacco exposure, alcohol use, diet, physical inactivity, unhealthy weight, exposure to **carcinogens** such as ultraviolet (UV) and ionizing radiation, as well as chemical and biological carcinogens (viruses, infections, etc.). In 2007, there was increased adoption of health promotion and wellness strategies at the local and provincial/territorial levels with a growing commitment among Canadian decision makers to take action on the broad range of conditions known to contribute to poor health outcomes.

DID YOU KNOW?

In Canada, more than 300 non-smokers die every year from lung cancer that is related to their exposure to second-hand tobacco smoke.¹²

Tobacco

The association between smoking tobacco and lung cancer had been widely known for a relatively long time in 2007. Tobacco was increasingly associated with the development of other cancers including cancer of the mouth, pharynx, larynx and esophagus,⁶ and had been linked to cancers of the bladder, stomach, kidney and pancreas.⁷

Cigarette smoking was the foremost preventable cause of lung cancer, accounting for 85% of all new cases of lung cancer in Canada.⁸ There was evidence in 2007 that the risk of developing lung cancer increased the more you smoked and the

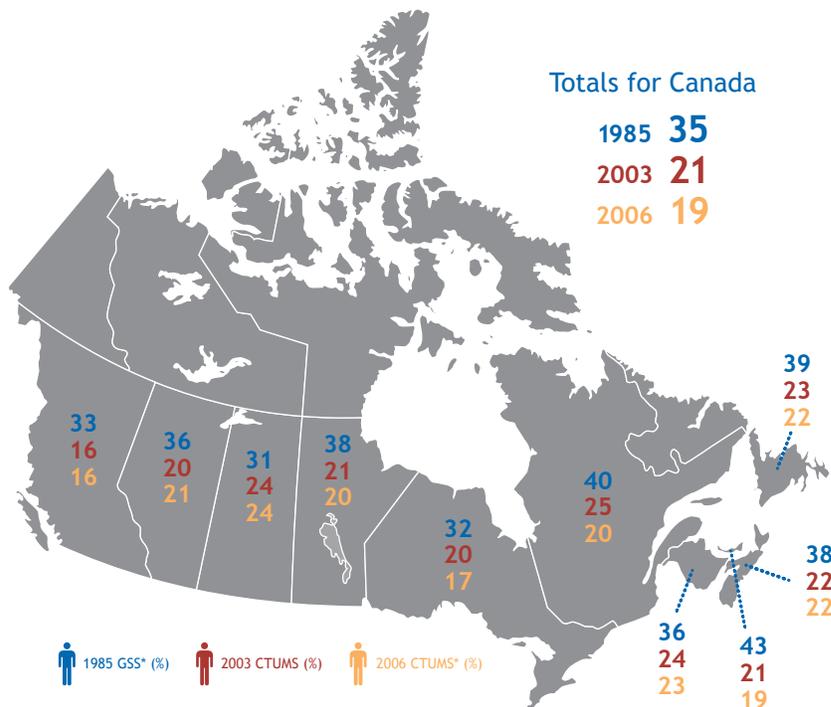
longer you smoked.⁹ Living with a smoker was known to increase a non-smoker's probability of developing lung cancer by 20% to 30%.¹⁰

A trend in decreasing tobacco consumption began for Canadian males in the mid 1960s. However, while the prevalence of female smokers was always lower than for male smokers, the number of women smoking increased over time until it began to decline in the early 1980s.¹¹ There were variations in smoking rates across Canada, but all provinces saw a reduction in the proportion of their population who smoked between 1985 and 2006 (Figure 9).

FIGURE 9

Provincial smoking trends

Current smokers aged 15+, by province, Canada, 1985, 2003 and 2006, proportion (%)



Sources: Health Canada. Canadian Tobacco Use Monitoring Survey: Annual File: 2006.

Laws enacted by 2007 included restrictions on the advertising and promotion of tobacco products, package labelling and warning standards, bans on smoking in public places, restrictions on youth access to tobacco products and increases in taxation on tobacco products. There were emerging programs to raise public awareness of the health risks of smoking along with supports and incentives for cessation of smoking. While the policies and legislative measures focused on tobacco were numerous in Canada, they formed a patchwork of initiatives across municipalities and regions, rather than a cohesive strategy.

Unhealthy Weight and Nutrition

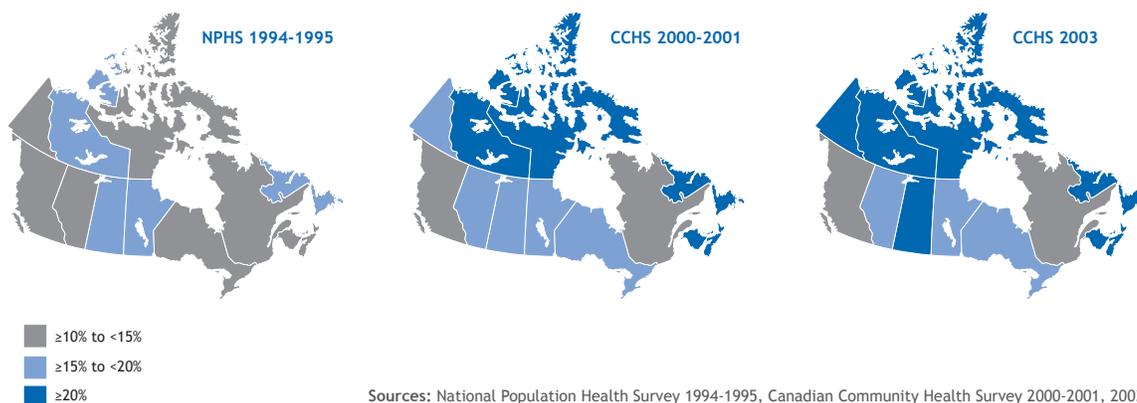
Obesity affected virtually all ages and socio-economic groups in 2007 and was linked with cancers of the esophagus, pancreas, colorectum, breast (postmenopausal), endometrium and kidney.¹³

The National Population Health Survey (NPHS) and the Canadian Community Health Survey (CCHS) reported that obesity rates, as measured by **Body Mass Index (BMI)** in Canada increased between 1994 and 2003 (Figure 10).

DID YOU KNOW?

Canadian youth ranked fourth-highest for obesity in an international study of adolescents from 34 countries.¹⁵

FIGURE 10
Trends in obesity, Canada, 1994 to 2003



The ACT (Action in your Community against Tobacco) program was launched in Nova Scotia in 2001 when the province had the highest smoking rate in Canada (30%). ACT was designed to increase the ability of community members to take action against tobacco in their own communities. The innovative program recognized that reducing tobacco use required a shift in community attitudes and norms about smoking and that this could only be achieved when local community members were committed to investing themselves in the effort. Using a “train the trainer” model, “coaches” were identified, provided with the tools and resources need to take action and asked to recruit members from their community to become ACT volunteers. By 2004, tobacco use had decreased considerably in Nova Scotia, and was in alignment with the national average.¹⁴



DID YOU KNOW?

The evidence suggests that there is no safe level of alcohol consumption to prevent an increased risk of cancer. However, due to the potential benefits of alcohol consumption for coronary heart disease, recommendations for cancer prevention suggest limiting alcohol intake to no more than one drink per day for women and no more than two drinks per day for men.

While rates of obesity varied across regions in Canada, with the highest rates observed in Atlantic Canada and the lowest rates in Quebec, Ontario and British Columbia, the trend towards an increase in obesity over time was consistent across the country. In Canada, 22% of Canadian adult females and 23% of adult males were classified as obese in 2004.¹⁶ The factors involved in the increasing rate of obesity are numerous and can act alone or in combination. Although scattered, various programs aimed at promoting healthy body weights had been implemented by 2007.

The situation regarding healthy weight in Canadian children and youth involves peers, home, school and the individual's characteristics, to name a few. Sugar and fat-laden foods were available in Canadian schools in 2007, with half of Canadian public school boards having exclusive vending machine agreements with soft drink manufacturers.¹⁷ Reduced physical activity and increased exposure to unhealthy foods contrib-

uted to unhealthy weights among the children and youth of Canada.

Targeted programs were promoting healthy eating, including fruit and vegetable consumption, with an increase in programs directly providing fruit and vegetables to children in schools. Although there was not a coordinated effort across the country, some initiatives were in place to promote the sale of healthy foods by vendors and dining establishments.

Alcohol

In 2007, the evidence showed that alcohol consumption was associated with cancers of the mouth, pharynx, larynx, esophagus, breast and with colorectal and liver cancer.¹⁸

Educational initiatives promoting responsible alcohol consumption were offered throughout Canada. The primary messages of alcohol education programs addressed the more immediate conse-

British Columbia initiated comprehensive and innovative school programs promoting active living, while other regions provided more limited support through grants to individual schools for school-based healthy living initiatives. *Action Schools! BC* was developed in response to a crisis in children's health, concerns about childhood physical inactivity and the escalating levels of childhood obesity. The program was designed to assist elementary schools in creating individualized action plans to promote healthy living. Between February 2003 and June 2004, Phase I of the *Action Schools! BC* initiative was conducted at the grades four to seven levels in ten pilot schools in the province.

quences of unsafe consumption including injuries, fights and motor vehicle collisions. Although not targeted towards cancer control, these messages may have encouraged and reinforced social norms around safe levels of alcohol consumption. In 2007, the emphasis in Canada was on reducing binge, high risk alcohol consumption associated with trauma. However, alcohol consumption that was considered to be lower, but longer term risk (maximum of one drink per day for females, two drinks per day for males) was on the rise.

Sun Exposure

The majority of skin cancer is classified as a relatively less aggressive form of the disease, as compared to other cancers. Skin cancer was the most common form of cancer in Canada with a steady increase in incidence documented over the past 30 years.¹⁸ The published data available in April of 2007 were from a 1996 National Sun Exposure Survey in which half of adults surveyed reported being sunburned at least once during the summer months of that year, and 50% of children were reported to have spent more than two hours in the sun each day during the summer, with an estimated 45% of them becoming sunburned. Women were more likely than men to adopt sun safety measures and the use of most sun protection measures increased with age. Individuals aged 15 to 24 spent the most time in the sun and rarely used sun protection.

HPV Immunization

Vaccines boost the immune system's natural ability to protect the body against harmful invaders such as viruses that can cause disease. Some vaccines have been designed to prevent cancer from developing in healthy people. The human papilloma viruses (HPVs) are a group of more than 100 related viruses called papilloma viruses because certain types may cause warts or papillomas that are benign (non-cancerous) growths.

By 2007, it was well established that certain strains of HPV, referred to as high risk, **onco-genic** or carcinogenic HPVs, were associated with the development of cancer.¹⁹ Three in four (75%) Canadians were predicted to have had at least one HPV infection in their lifetime.²⁰ Most HPV infections occur without symptoms and go away over the course of several years, without any treatment. Despite this, there are instances where HPV infection persists over a long time and can increase a woman's risk of developing cervical cancer.

A vaccine that protected against certain strains of HPV was available in Canada prior to 2007. At that time, the Canadian federal government set aside \$300 million to launch a nationwide vaccination program through financial incentives to the provinces. The aim of the national strategy was

Local efforts to reduce the risks of sun exposure included the development of policies and sun safe environments in settings where children were at greatest risk of UV exposure. Programs such as the design of outdoor spaces to provide shade in schools and daycares provided new and innovative approaches to addressing the negative health impacts of sunlight, while encouraging outdoor activity.

A program of school-based immunization and vaccination against HBV in targeted groups (ages 9 to 13) was implemented in Canada in the early 1990s.²² It was estimated that the program might prevent approximately 63% of all acute HBV infections and nearly half of chronic infections.²²

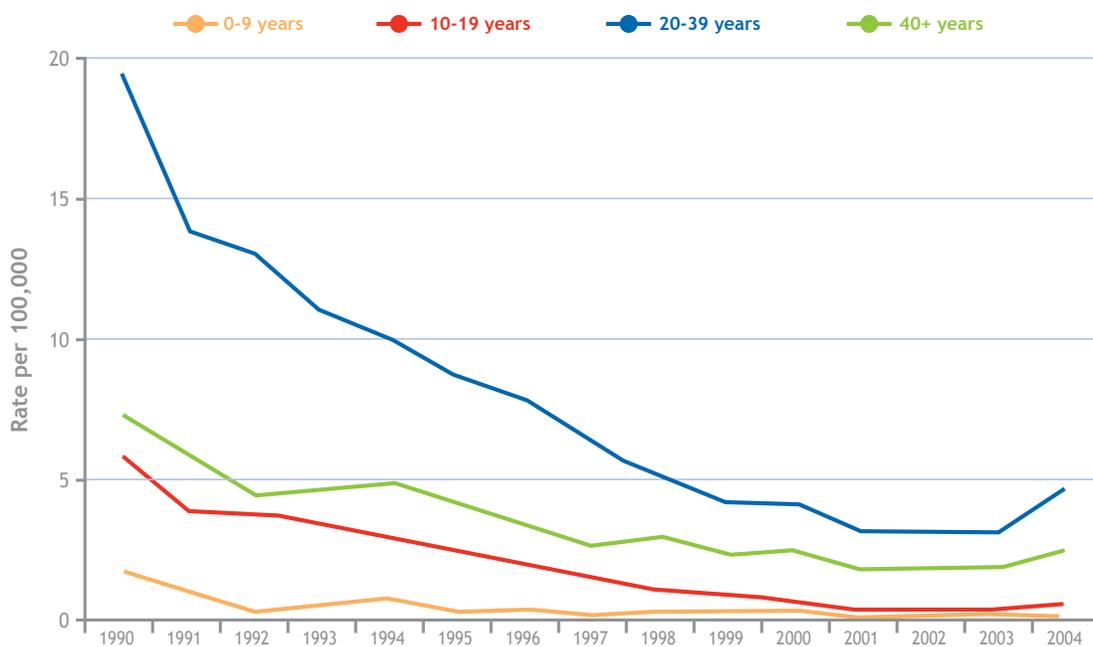
to reduce the incidence of cancer of the cervix. In January of 2007, the Society of Gynecologic Oncologists of Canada endorsed the National Advisory Committee on Immunization's recommendation that all Canadian girls and women (aged 9 to 26) be vaccinated against HPV,²¹ and several provinces (Nova Scotia, Newfoundland and Labrador, British Columbia, Ontario) had decided to move forward with the voluntary vaccination of school-aged girls in the upcoming school year. However, no programs were in place.

HBV Immunization

The hepatitis B virus (HBV) causes hepatitis, which is an inflammation of the liver. It is carried and passed to others through blood or sexual contact, or infants born to infected mothers may become infected with the virus. Infection with the HBV can lead to chronic liver disease and can put people at risk of death from cirrhosis of the liver and liver cancer.

A vaccine against HBV has been available in Canada since 1982, with 95% effectiveness in preventing HBV infection and its chronic consequences. It was the first vaccine that was found to act against a major cause of human cancer.

FIGURE 11
Hepatitis B Virus - Trends in reported incidence rate by age group, Canada, 1990 to 2004



Source: Public Health Agency of Canada, Canadian Immunization Guide, 7th edition, 2006.



Primary Prevention: Challenges in 2007

Cancer prevention efforts were of growing importance in 2007, with an expanded focus on research into what works for cancer prevention and increased efforts to evaluate practices already in the field to better inform program and policy development. However, there was considerable variance in the scope of preventive efforts across regions, which in turn resulted in unequal access to programs for Canadians.

While local prevention efforts were in evidence in 2007, there was a lack of data available at a local level about the outcomes of prevention programs, which would have allowed practitioners and policy-makers to better target cancer prevention programs to specific populations in specific areas.

Many challenges existed to efforts to overcome childhood and adult obesity and the consequent affects associated with unhealthy weight. These included, for example, widespread availability of less healthy foods and drinks and a reduction in physical activity.

Although there was an emerging body of evidence linking ultraviolet radiation with negative health impacts, including cancer, there were few tar-

geted programs in place in Canada to address the issues in 2007.

There were no organized HPV vaccine programs operating in Canada, although decisions had been made by several jurisdictions to implement school-based vaccination programs in the upcoming school year.

The goals of cancer prevention address many of the same factors as those associated with the prevention of other chronic diseases. Early efforts to increase collaboration between chronic disease groups were based on the knowledge that this collaboration would have encouraged a more coordinated approach to chronic disease prevention in Canada. However, in April of 2007 an alignment of efforts across all chronic disease prevention groups was not yet in place.

An important issue for prevention efforts in 2007 was that public knowledge about primary prevention and modifiable risk factors was lacking. Specifically, knowledge about emerging evidence was sparse. For example, public awareness about key infectious agents such as HBV and HPV, which were known to be associated with cancer, was limited. This meant that there was a need for increased information sharing with Canadians.



Screening for Cancer

Screening provided an important tool for the early detection of some cancers but was not intended to diagnose cancer. People with positive or suspicious findings were referred to their physicians for definitive diagnosis and treatment. The goal of screening programs was to detect as many cancers as possible as early as possible and to ensure that the diagnosis and the treatment or care provided resulted in lower mortality rates.

In 2007, screening for cancer was provided through two mechanisms in Canada. The first was through an organized population-based approach, in which specific parts of a population (e.g., females of a defined age) were targeted for screening of a particular

disease. Screening was also provided in an opportunistic (i.e., less coordinated or ad hoc) method.

Population-based (organized) screening programs were recommended for implementation if there was evidence that they reduced mortality, were able to detect disease early, were safe and when treatment for the cancer existed.²³ In 2007, screening was known to be effective for specific cancer sites, including breast, colorectal and cervical cancers. The benefits of prostate cancer screening had not been determined, and it was known to have risks from downstream diagnosis and subsequent treatments. However, Prostate Specific Antigen (PSA) testing for prostate cancer was widely used as an opportunistic screening tool in 2007.

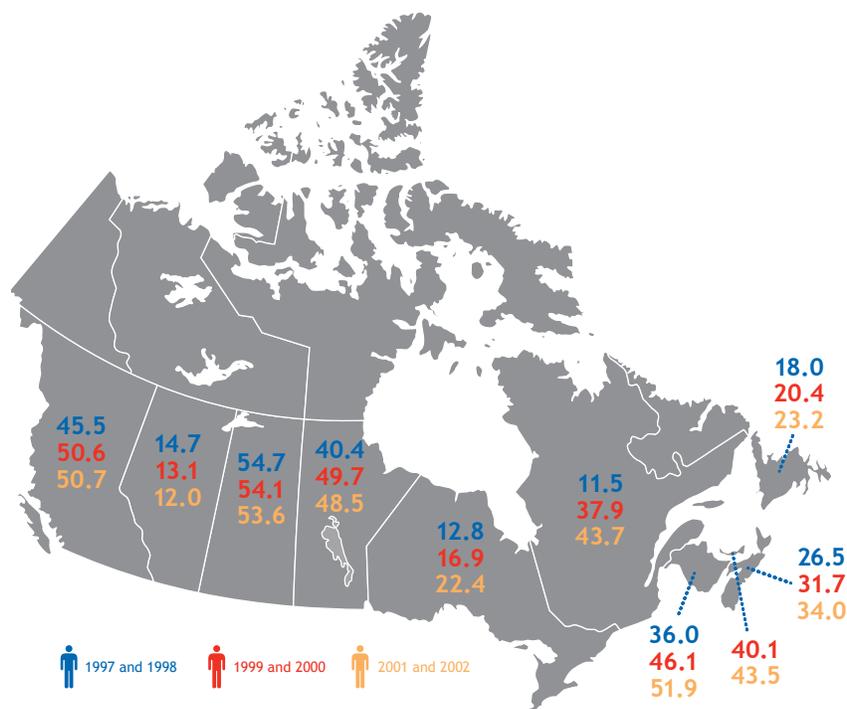
Breast Cancer Screening

By 2003, all provinces and two territories had established organized breast cancer screening programs using mammography and several had developed capabilities for on-site clinical breast examinations (Manitoba, Ontario, Nova Scotia, PEI and Newfoundland and Labrador). All programs targeted women aged 50 to 69 and several programs extended service to younger women (age 40) and to older women (age 70+).

The Canadian Breast Cancer Screening Initiative had established 70% as the target participation rate for women aged 50 to 69. Participation in organized breast cancer screening programs varied significantly by province (Figure 12). These levels of participation, however, did not include women who had received their screening mammogram outside of an organized program. These data, therefore, do not capture a significant proportion of breast screening activity taking place at the time.

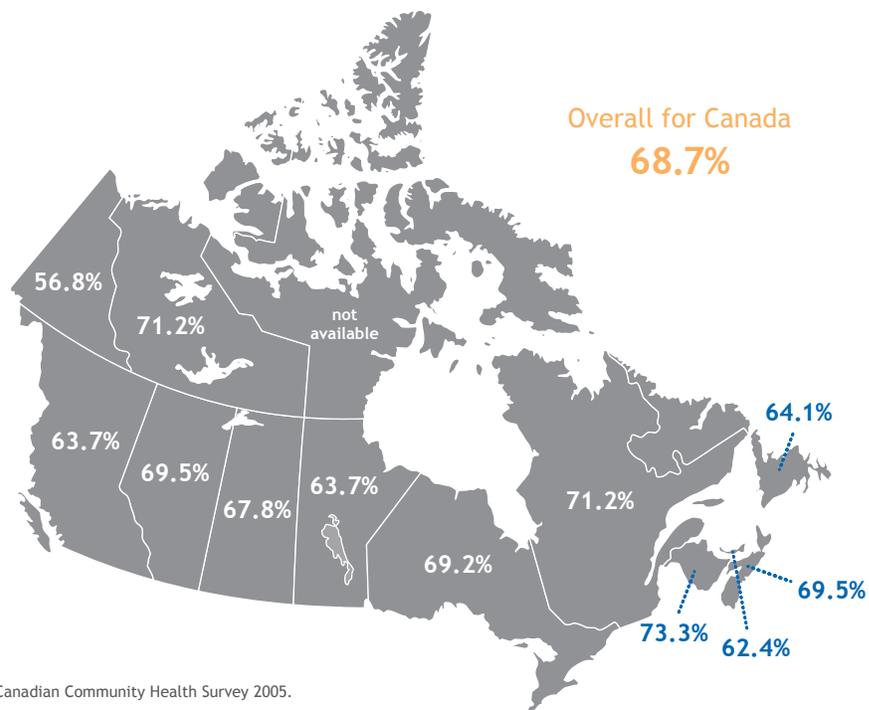
FIGURE 12

Participation in organized breast cancer screening programs, proportion of females aged 50 to 69, percent participation (%)



Source: Public Health Agency of Canada. Organized Breast Cancer Screening Programs in Canada. Report on Performance in 2001 and 2002.

FIGURE 13
 Percentage of asymptomatic Canadian women aged 50 to 69
 who report having a mammogram within the past two years, 2005



Source: Canadian Community Health Survey 2005.

Figure 13 illustrates that just under 70% of **asymptomatic** Canadian women surveyed in the 50 to 69 age group reported having had a mammogram within the preceding two years through

some mechanism (opportunistic or organized). In this case, these women did not have any breast symptoms (e.g., lump, pain).

Several initiatives were underway to ensure that women in rural and remote areas had access to screening mammography. Such programs were documented to have increased the proportion of women receiving mammograms to screen for breast cancer. For example, in the late 1990s, an outreach program in Manitoba attempted to overcome obstacles women had in accessing mammography. The Manitoba Screening Program put vans on the road, travelling to 50 rural and northern communities to offer breast screening. Local communities spread the word about the travelling clinic and booked appointments. This, along with other initiatives, brought organized program participation rates in the province from 20% in 1995 to 45% in 1999.²⁴

Cervical Cancer Screening

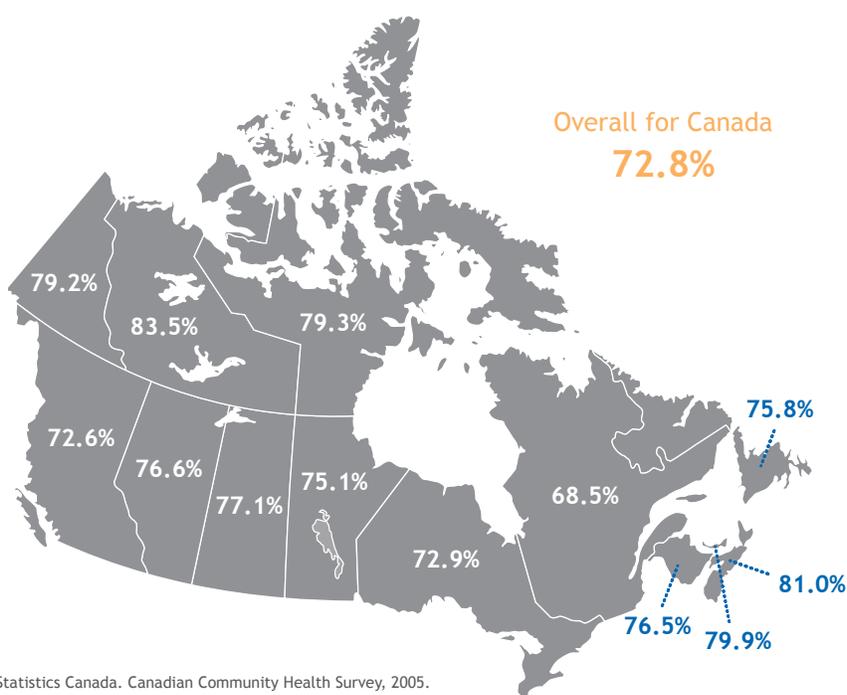
The Papanicolaou (Pap) test was the most frequently used screening tool for cervical cancer, with high effectiveness in reducing the incidence of cervical cancer. The Pap test detects pre-cancerous conditions and cancers at an early stage, when treatment is most effective. Incidence and mortality rates for cervical cancer dropped in Canada: a 20% decrease for incidence and a 21% reduction in mortality between 1992 and 2003, in part due to screening with the Pap test.

By 2007, eight Canadian jurisdictions had cervical cancer screening programs in place. A population-based (organized) approach to screening was used in two of these, while others relied on a combina-

tion of approaches. Guidelines for screening varied across jurisdictions with the recommended age for initiation being age 18 or at the start of sexual activity and the recommended termination of screening towards the end of the sixth decade of life (67 to 69 years).²⁵

Seventy three percent of Canadian women surveyed in the CCHS, aged 18 to 69, reported having been screened for cervical cancer in the three years before 2005. The percentage of women screened ranged from a low of 69% in Quebec to a high of just over 80% in the Northwest Territories and Nova Scotia (Figure 14). The proportion of women being screened was highest in the 25 to 34 age group (83%) followed by the 35 to 44 group (79%).

FIGURE 14
Percentage of women aged 18 to 69 years reporting a Pap test within the last 3 years, by province, 2005



Source: Statistics Canada. Canadian Community Health Survey, 2005. CANSIM Table 105-4042

Colorectal Cancer Screening

Evidence showed that annual screening with a Fecal Occult Blood Test (FOBT) could reduce colorectal cancer mortality rates by 33%.²⁶ If a screening FOBT test was positive, it was usually followed by a colonoscopy to confirm diagnosis and to remove precancerous polyps.

National guidelines recommending FOBT and/or colonoscopy/sigmoidoscopy were published in 2001²⁷ and 2002.²⁸ These guidelines generally recommended the screening of average risk individuals without symptoms between 50 and 74 with FOBT, annually or biennially.

In 2003, the CCHS survey of British Columbia, Saskatchewan, Ontario and Newfoundland and Labrador, included questions about colorectal cancer screening. The survey identified considerable provincial variation, with 17.6% of respondents across the four provinces aged 50 or older reporting that they had received an FOBT over the previous two years or a colonoscopy or sigmoidoscopy within the past 10 years.²⁹

Prostate Cancer Screening

The amount of PSA in the blood has been used to screen for prostate cancer. In the mid 1990s, the Canadian Task Force on Preventive Health Care concluded that there was not enough evidence to include PSA screening in the routine healthcare of men over the age of 50 because of the high rate of false positive results and the known risk of adverse affects associated with therapies of unproven effectiveness.³⁰

In 2003, between 15% and 27% of Canadian men aged 40 and over who were surveyed through the CCHS reported having had a screening PSA test in the previous 12 months. The survey found age variations with the rate ranging from 9% of men aged 40 to 49 to 36% of men aged 60 to 69.

In January 2007, Ontario was first to announce a population-based provincial screening program for colorectal cancer in Canada. Alberta and Manitoba also had programs in development at that time.



Screening: Challenges in 2007

There was an expanded focus on research into cancer screening and increased efforts to evaluate practices already in use to better inform program and policy development. As new technologies emerged, such as Magnetic Resonance Imaging (MRI) or HPV testing for example, their role in population-based screening had to be assessed.

A movement to implement evidence-based screening initiatives was underway in Canada in 2007, but these efforts were sporadic and had varying degrees of success. One of the challenges that existed in screening was the inability to implement organized programs in a timely fashion. While screening programs for cervical cancer existed in 2007, only two of these were organized programs. Although the evidence of effectiveness was sound, there were no organized programs for colorectal cancer screening in operation and low participation in opportunistic screening.

Participation of the target population in screening programs continued to present challenges. By

March 31, 2004, the average national participation rate for Canadian women in organized mammography screening programs was 37% and no program had yet reached the 70% goal,³¹ while the 2005 CCHS survey showed that nearly 70% of Canadian women in the target age group had received a screening mammogram (opportunistic and/or organized). Achieving participation targets posed a challenge that was predicted to continue as the population aged, with increasing numbers of people in the target age ranges.

From the perspective of data analysis, the dual use of organized programs and opportunistic screening made it difficult to track those being screened through ad hoc (opportunistic) mechanisms. The data on those screened outside of an organized program were not available in a systematic way for analysis (e.g., they were not submitted to a registry), although some attempts were made to use health service billing information to help determine the number of people screened through informal means. As well, with opportunistic screening there was no way to ensure that the appropriate population group was targeted for screening.



Diagnosis of Cancer

Diagnostic information is important in guiding treatment for individual patients. It is also integral, through the analysis of diagnostic data, to explaining trends in cancer incidence, prevalence and mortality. Accurate and timely diagnosis of cancer is critical to the development of an appropriate treatment plan for patients suspected of having cancer. Until diagnosis is complete, and unless that diagnosis is accurate, patients cannot be treated appropriately or optimally.

Pathology

A diagnosis of cancer usually starts when a pathologist analyzes tissue specimens from surgery or a biopsy to diagnose the presence (or absence) of cancer. Over time, pathology reports have become increasingly complex and include information about the type, size and stage of tumour, plus the status of the lymph nodes and descriptors of the cancer. Pathology reports give information about prognosis and help clinicians decide on the best therapies for patients.

In the late 1990s, there was growing recognition that due to their increasing complexity, pathology reports were often missing key elements required for the management of a patient's care.³² To counter this problem, The College of American Pathologists developed and used 'checklists' to provide a set of standardized protocols for pathology reports.³³ From this initiative, synoptic pathology reporting evolved as a means of ensuring the quality of pathology reports and incorporating two concepts: 1) use of a consistent content standard, often referred to as a 'checklist', and 2) use of electronic reports to capture the information.

By 2007, the Canadian Association of Pathologists and provincial pathology associations were considering an approach to standardized pathology reporting, including potential adoption or adaptation of the College of American Pathologists' checklist standard, but no decision had been made. Through collaboration between Cancer Care Ontario and the Ontario Association of Pathologists, Ontario was the first jurisdic-

tion to endorse and implement the College of American Pathologists' standard for reporting. While pathologists in many provinces informally adopted these checklists as part of their practice, Ontario represented the only systematic approach to implementing the checklists. In parallel with this initiative, Ontario was also the first province to incorporate the use of electronic reporting for synoptic pathology in Canada.

Staging

Staging describes the extent of an individual's cancer based on the size of the original (primary) tumour and the degree to which the tumour cells may have spread into other tissues of the body. Staging information is critical to the management of many forms of cancer because it helps to determine the anticipated prognosis of a cancer and guides the development of treatment plans. Staging information was available in other countries in the world including the United States and Australia in 2007, but it was not consistently available in Canada. Without staging information it was difficult to fully understand trends in cancer and/or predict outcomes for patients on an individual or aggregate basis.

Historically, the American Joint Commission on Cancer TNM (Tumour, Node, Metastasis) staging system has been the one most commonly used by physicians to stage cancer when possible. The treating physician reviewed both the pathologic and clinical stage information contained in pathology, surgical and diagnostic reports to assign stage at diagnosis. Higher numbers for stage indicated more extensive disease: greater tumour size and/or spread of the cancer to nearby or more distant parts of the body. In 1998, a national staging policy declared that the recording of stage in the medical record by the treating physician must be the standard of care for every cancer patient across the country.³⁴

In Canada, there was a move to '**collaborative stage**', which is a way of getting data about stage by collecting and incorporating non-anatomic prognostic and predictive factors, such as tumour markers. Collaborative stage improved the ability to examine trends in cancer by stage over time. In 2006, collaborative stage was endorsed as the new standard for the capture of staging information in Canada. However, in 2007 consistent and comprehensive staging information was not available nationally.

DID YOU KNOW?

Although a consistent way to capture staging information was not available in Canada, data from the American Cancer Society showed the importance of determining stage to survival from cancer. When the example of colorectal cancer was used, those with early stage disease (Stage 1) had a 93% survival rate, while overall, advanced stage cancers (Stage 4) had 8% survival.³⁵

In early 2007, Alberta, Manitoba and Prince Edward Island had begun to submit population-based collaborative stage data for the four most common sites of cancer in Canada (breast, colorectal, prostate and lung cancers).



Diagnosis: Challenges in 2007

In 2007, a major challenge facing Canadian cancer control was the inconsistent availability of staging information within medical records for a patient. Stage data generally came only from pathology reports in 2007, and additional clinical information that would help to fully understand a patient's stage of disease was not always available. Such clinical information would have been useful in determining the best treatment for individuals or for analysis of outcomes.

Overall, there was inconsistency in the capture and submission of cancer staging information to the Canadian Cancer Registry, making analysis of cancer trends in Canada difficult because important information about the severity and extent of the disease at diagnosis was not available. In 2007, the submission of stage data varied widely across provinces and among disease sites. The staging information submitted to the registry was not always representative of the entire population because there was better coverage in specialized cancer centres than in clinics or non-cancer centre general hospitals.

These gaps in information had an impact on both individual patients and the knowledge available about specific kinds of cancer and their trends in Canada. By having data on cancer stage, using a standardized method, researchers could have evaluated many aspects of cancer control, including whether screening was effective. Effective screening should result in a cancer being diagnosed at a lower (earlier) stage because of earlier detection. There were strategies emerging in early 2007 that recognized the need for improved stage information for patient care and for understanding trends in Canada. As well, there were plans emerging to leverage data captured for other purposes, such as electronic pathology reports and other datasets. It was generally acknowledged that as more information became available in electronic health records, there would be opportunities to leverage this information as part of the cancer registry processes. There were some initiatives taking place in various parts of the country including efforts to develop of a customized electronic health record (OPTx) for cancer facilities in Manitoba, Alberta and Saskatchewan. However, in 2007 the electronic health record was not a reality in most facilities and jurisdictions Canada-wide.

Treatment of Cancer

Most kinds of cancers were treated through surgery, chemotherapy and radiation, either alone or in combination. Treatments for cancer have continued to evolve over time with significant advances in technologies and knowledge. In 2007, as treatment became more complex, it was of increasing importance to make certain that the appropriate mechanisms and processes were in place to ensure the well-being of patients.

Surgery

Cancer surgery represents a key component of cancer care, often in conjunction with chemotherapy and/or radiation therapy. Cancer surgeries in Canada were performed by a variety of specialties and subspecialties in a variety of settings (e.g., cancer centres, acute care facilities). Surgical techniques evolved over time, and in 2007 there was an increased focus on performing minimally invasive (often laparoscopic) procedures in many

areas of treatment (including cancer). It was hypothesized that less invasive surgeries would accelerate patient recovery, allow many patients to return home sooner and improve the efficiency of the health system.

In late 2004, the first ministers for health from each of the provinces met and listed timely access to quality healthcare at the top of their collective agenda. Specifically, the first ministers committed to achieving measurable improvements in access to care in priority areas by March 31, 2007. One of these areas was cancer surgery.³⁶ This focus on cancer surgery by the health ministers prompted increased efforts to investigate and analyze the access-to-care trends in Canada. In early 2007, it was documented that the number of cancer surgeries had grown by 5% between fiscal 2002 and 2006, but after adjusting for population growth and aging, cancer surgery rates had actually declined by 5%.³⁷ These flat or declining rates

In 2007, the Alberta Cancer Board had undertaken an advanced initiative in the development and implementation of a web-based operative report template to collect surgical data in a synoptic format. The Web-based Surgical Medical Record (WebSMR) was developed in 2000 as an interactive electronic questionnaire, designed for easy use by surgeons, capturing all the essential information for a medical record, with a view to eventual integration of the information into a patient's electronic health record. In 2004, the WebSMR was piloted in Alberta by eight surgeons. By 2007, the potential for synoptic reporting became available for liver, colorectal, breast, sarcoma, melanoma, thyroid and ovarian cancers in Alberta. This was through a deployment plan for the province funded by Canada Health Infoway, with plans to expand surgical synoptic reporting to all cancer disease sites. By April of 2007 there were 26 Alberta surgeons participating and approximately 840 synoptic surgery reports in the system.



were seen in all provinces and territories. Cancer surgery trends are difficult to interpret because procedures vary widely in complexity and many different subspecialties perform them.

While more in-depth analysis would be required to fully understand the trends, there were some overarching and common factors that may have affected the trends in cancer surgery at the time. There was an overall shift in where operative procedures were performed, with a system-wide movement to higher use of the day surgery setting. Procedures performed in other (non-operating room) departments, clinics or offices were not included in the surgical datasets. For some cancers in the past, diagnosis was made through surgical procedures performed in the operating room, and by 2007 there had been a move towards an increased use of more sophisticated image-guided procedures performed in radiology units. In parallel, there was an association between decreasing surgical volumes and the fact that age-standardized rates of new cancer cases were decreasing.

In cancer surgery, complex information is recorded to describe the cancer and the details of the surgery and to ensure the completeness of information required to manage care after surgery. Using only narrative surgical reports, a significant proportion of studied reports were found to be incomplete, leading to a lack of information available to treating clinicians.³² When surgery reports were examined two years after the implementation of synoptic surgical reporting, in this study the proportion of incomplete reports had dropped to 0.5%. Providing surgeons with a structured electronic checklist (synoptic reporting) as an alternative to the traditional dictated narrative case report was an innovation implemented in Alberta, but one that had not been adopted Canada-wide in 2007.

As information about the Alberta experience began to spread, heightened interest emerged in other jurisdictions, among administrators and with clinicians. The evidence from this inaugural work in Alberta formed the basis for other Canadian initiatives in the area of surgical synoptic reporting.

Chemotherapy

Many forms of cancer were treated with chemotherapy, often in conjunction with surgery and/or radiation therapy. Chemotherapy has been at the forefront as an area of innovation and improvement in cancer treatment and patient care over the last decade. Chemotherapy protocols have advanced over time and have increased in complexity, especially in terms of combinations of drugs administered, timing of the administration, where they were administered, who administered them and doses of drugs. In parallel with increasing complexity, there were serious potential toxicities associated with the use of chemotherapy agents, either individually or in combination. The process to dispense chemotherapy agents often entailed complex mathematical calculations for each patient on each occasion. The safe administration of chemotherapy depended on a combination of actions and conditions by many

members of the healthcare team, producing multiple contributing factors in ensuring patient well-being. In 2007, these complexities were known and it was recognized that increased efforts and innovation would be necessary to appropriately address them. The death of an Alberta resident in the summer of 2006 highlighted the awareness of challenges that were being faced in terms of patient safety associated with complex chemotherapy regimens.

Chemotherapy drugs and those needed to support patient well-being during cancer treatment comprised a significant portion of health expenditures. These costs continued to rise as new drugs came onto the market in 2007. Cancer patients' access to cancer drugs relied on several factors, including the process for evaluating and approving new drugs for cancer treatment and a funding mechanism for cancer drugs administered

While evidence about the merits of delivering chemotherapy in a patient's home community was far from new, there were few established chemotherapy programs in rural communities in Canada in 2007. In the mid 1980s an outreach program was implemented in Manitoba. By early 2007 this program had resulted in chemotherapy being provided in 17 rural communities, providing close to home treatment for approximately ¼ of all newly diagnosed patients who required such treatment. Similarly, the Northwestern Ontario Community Cancer Care Program served a population of about 250,000, across a massive and largely remote geographic area. An innovative program was put in place that saw the regional cancer centre partnering with local community hospitals to administer chemotherapy in rural areas. Treatment plans were developed and initiated at the cancer centre, then designated specially trained family physicians took over treatment in the community. Progress, including complications, was monitored locally in partnership with the responsible oncologist from the regional cancer centre.³⁸

DID YOU KNOW?

For radiation therapy in 2007, six of the 10 provinces were identified as having over 80% of the population treated within four weeks, one was identified as having 60 to 69% treated within four weeks and three provinces were not evaluated due to lack of data.⁴¹

outside hospital (e.g., oral drugs). The provision of healthcare in Canada is by the provincial ministries of health, resulting in variations in coverage, criteria for coverage and costs for cancer drugs. Of 115 established cancer drugs in 2007, only seven were provided free to cancer patients in all 10 provinces, although nearly half of the drugs were available free in at least nine provinces.³⁹

A Canada-wide, evidence-based cancer drug review process was put in place in 2006, and in March 2007 the Joint Oncology Drug Review (JODR) was formed and tasked with building a national cancer drug review process to support more consistent and transparent decision making, leading to the availability of standard cancer therapy for Canadians. The process was supported by Canadian jurisdictions as a pan-provincial collaborative, with Quebec as an observer.

Radiation Therapy

About half of all people newly diagnosed with cancer require radiation treatment at some point during their treatment for the disease. This would mean that more than 65,000 of those diagnosed with cancer in 2003 would have required radiation treatment during the course of their care, with the majority of patients receiving it in one of the 35 existing radiation treatment facilities in Canada.

In December 2005, provinces and territories announced a set of national benchmarks for acceptable wait times for several specific health-care services. This included a benchmark for radiation therapy of no more than four weeks from the time a patient became ready for treatment to the time the patient received radiation therapy. All provinces and territories began work to implement processes for the measurement of radiation therapy wait time statistics and strategies to reduce those wait times where required. In early 2007, nine of 10 provinces had been collecting and publicly reporting radiation therapy wait times.⁴⁰ The frequency of public reporting of results varied significantly from province to province, ranging from monthly, though quarterly, to annual reporting.

Treatment: Challenges in 2007

The accelerated pace of advances in a broad range of treatments has benefited Canadians with cancer. However, these advances have various challenges associated with them. As treatments advanced, they became more complex and this increased level of complexity demanded a more coordinated approach to treatment that was not in place in 2007. For example, there was no national standard for the content of surgical operative reports for cancer surgeries, which meant that there were varying degrees of completeness and accuracy about these procedures across the country. The only formal effort to adopt synoptic



reporting for cancer surgery was in the form of a pilot project in Alberta, while the other jurisdictions were using a variety of surgical reporting strategies.

As surgeries were more likely to occur in day surgery/outpatient settings in 2007 and data were not routinely collected on day surgery procedures across the country, it became difficult to measure the number of cancer surgeries that were taking place in the country. This presented a challenge in planning care and in planning resources to appropriately deliver healthcare for the current number of cases and for any predicted increases.

Chemotherapy presented challenges on several fronts in 2007. In April 2007, there remained significant provincial and territorial inconsistencies in the area of access to cancer drugs, although important work was underway. Early efforts had begun to try to address the evaluation and approval process, funding and guidelines, with discussions underway with all the provinces. The

separate processes employed by individual provinces and territories to review the clinical efficacy and in some cases, cost-effectiveness of new cancer drugs, presented a challenge in the ability to uniformly track and measure cancer drug access across Canada. A number of established cancer drugs were not publicly funded, and there were significant differences in the proportion of cancer drugs funded publicly, especially between western (British Columbia to Manitoba) and eastern (Ontario to Atlantic Canada) provinces. Although a recommendation had been made in 2006 by the Canadian Cancer Society that a national pharmaceutical strategy be funded and implemented ensuring full and equitable access to drug treatment and care, this had not taken place.

The complexity inherent in the delivery of chemotherapy to cancer patients also presented safety challenges. In August of 2006, a 43 year old Albertan died after a chemotherapy incident. The coroner determined the cause of death to be as a result of fluorouracil toxicity. The woman

had inadvertently been given an infusion of the chemotherapy over a 4 hour period, rather than the intended 4 day period. It was recognized that the same or similar incident could happen in other health care organizations and that the implementation of system safeguards and safety enhancements were required. The safe delivery of chemotherapy required integration of several components and levels of the cancer healthcare system and required Canada-wide effort.

Positive changes for patients, in efforts to ensure people could return or remain as close to home as possible, meant challenges for the delivery of healthcare. These challenges included the fact that treatments, including chemotherapy were more likely to be administered to the same person by different practitioners in different facilities. This approach required a high level of coordination, but such coordination was not in place in 2007.

Access to care was highlighted in the field of radiation therapy, where the key challenge with the provincial radiation therapy wait times measurement was the lack of national standard definitions for how to measure wait times. Because provinces used different definitions, it made it difficult to compare performance across provinces. The key differences lay in the definitions of wait time intervals and how these intervals were measured, resulting in a lack of consistent reporting of radiation therapy wait times by all jurisdictions across

Canada. There were minimal data available to adequately understand and measure the amount of time people waited for radiation therapy and the impact of that wait on their outcomes.

The Supportive Care of Cancer Patients

Traditionally, the emphasis in cancer control has been on diagnosis and treatment and more recently, on prevention and early detection. Relatively less attention has been paid to the emotional, psychosocial needs of cancer patients and their families. Cancer and its treatment have much more than a physical impact. There are social, psychological, spiritual, informational, practical and emotional consequences. These exist from the time a person thinks there could be something wrong and continue throughout diagnosis, treatment, follow-up care, survivorship, or end of life and bereavement

As the number of Canadians living with cancer continued to grow in 2007, the requirement for supportive care was increasingly recognized. The supportive care of cancer patients and families refers to understanding and intervening in terms of treating the social, psychological, emotional, spiritual, quality-of-life and functional aspects of cancer.⁴² Psychosocial and emotional distress was found to be a significant problem for up to half of all cancer patients, that emerged because of unmet needs for supportive care.⁴³



Efforts to enhance the scope and scale of cancer supportive care services were underway in Canada. Between 1998 and 2002, the work of several task forces and working groups examining **palliative care**, supportive care and psychosocial support culminated in a supportive care strategy published as part of the Canadian Strategy for Cancer Control. In March 2007, a report on a National Psychosocial Oncology Education Framework was published and provided a guide for setting priorities for fund allocation and for helping healthcare providers and educators to design and deliver education and training initiatives for Canadian cancer patients and their families.⁴⁴

In 2007, there was clear recognition that a person-centred approach was key to all aspects of cancer care. Alberta and Ontario developed standard assessments of psychosocial and emotional status. In 2004, the Sixth Vital Sign concept⁴⁵ emerged as

a measure of emotional distress to complement the standard four vital signs of temperature, blood pressure, pulse and respiratory rate along with the relatively newer fifth vital sign, pain. The Sixth Vital Sign was endorsed by the Canadian Strategy for Cancer Control.⁴⁶ Studies found high levels of fatigue (in 49% of all patients), pain (26%), anxiety (24%) and depression (24%), along with significant financial hardship and material challenges in a cross-section of cancer patients screened for emotional distress.⁴⁷ However, in 2007 there were few programs that were measuring these factors in their patients.

In parallel with growing recognition of the psychosocial needs of patients, cancer navigator programs were emerging as a specific strategy to increase access to supportive care and to improve the coordination and continuity of care for patients and families.

Supportive Care: Challenges in 2007

The role of supportive care in the cancer continuum received considerable recognition leading up to 2007. However, important gaps were noted in the provision of supportive care and the health-care system requirements to deliver that care.

While symptoms and side effects of cancer can be devastating, many cancer patients did not get the recommended supportive therapies, including effective pain management.⁴⁸ Most cancer patients experienced significant pain at some point, and many continuously suffer from unrelieved pain.⁴⁹ Cancer care was largely provided in the acute care hospital setting but rehabilitation programs, which were known to improve quality of life, were inadequately provided for Canadians. In terms of end-of-life care, most patients did not die in their preferred location,⁵⁰ and only 5% receive palliative care.⁵¹ This access was uneven across the country.

A review of standards and guidelines for psychosocial, supportive and palliative care revealed that there was a sizeable body of work in the area in

2007, but there remained limited uptake in clinical settings across the country. There was recognition of the need for a repository of best-practice standards and performance indicators specific to psychosocial, supportive and palliative care.

A fundamental issue in supportive care was the inadequate provision of information and education to patients and their families, with half of cancer patients not getting the information they needed, when they needed it, to help them make critical treatment decisions. Increased patient access to knowledge about supportive and palliative care (e.g., online patient navigation tools, use of telehealth systems and services for First Nation and Inuit communities) along with increased research, training and accreditation capacity were needed in Canada.³

Overall, there was a growing recognition that in order to address these gaps, a systematic assessment approach applied to all patients and an infrastructure and standardized process for addressing these needs were required.

By 2007, two successful models of navigation were underway in Quebec and Nova Scotia. In 2000, nurse navigators were introduced in the Quebec cancer clinics, after a recommendation that a patient liaison be introduced to serve as a patient's first point of access into the system. The integration of nurse navigators into the system effected positive changes. In 2001, Nova Scotia began to implement their concept for cancer patient navigation with a program that defined navigation as "the individualized assistance offered, by a highly trained oncology health professional, to patients, families and caregivers to assist them through the maze of options and services needed to achieve the best possible outcomes and quality-of-life".⁵²

The Framework for Cancer Control in Canada



The implementation of a coordinated cancer control framework is central to optimizing patient care and to the safe and efficient delivery of healthcare to people with cancer. In the area of cancer, the need for a framework is heightened because of the interdisciplinary nature of the various groups and people providing prevention, screening, diagnostics and patient care, which ranges from primary care through diagnostic imaging, pathology, medical oncology, surgical oncology, radiation oncology, holistic (supportive) care and end-of-life care.

The cancer control community has long recognized the need for integrated, cross-jurisdictional and cross-sector planning as a means to maximize investment and knowledge and to improve the well-being of Canadians. The required framework for cancer control includes wide-ranging concepts covering a variety of areas fundamental to the success of the Canadian cancer control strategy.

The following section introduces the core components (Standards, Guidelines and Quality Programs; System Performance Indicators; Research; and Knowledge Management) that individually and collectively form the framework to influence the development and delivery of cancer control initiatives Canada-wide.

Standards, Guidelines and Quality Programs

Canadian cancer control organizations, hospitals, health care providers, and programs were working to ensure that high-quality service was delivered in every jurisdiction nationwide. In order to accomplish this, it was necessary to understand how the cancer system functioned and to measure how the system was performing. Standards and guidelines needed to be in place to ensure high-level functioning, and quality issues with particular concerns needed to be addressed.

At the outset of 2007, there was emerging recognition in Canada of the need for standards, guidelines and quality programs in healthcare overall and in cancer specifically. Standards and indicators had been developed independently by various cancer service delivery, research, policy and planning organizations in a number of provinces. There was wide variation in the scope, content and consistency of cancer standards, guidelines and quality programs.

Standards

Standards define the performance expectations and the structures or processes needed in the healthcare system to provide safe, high-quality care and services to patients.

In 2004, the Cancer Strategy for Cancer Control undertook a review to identify key cancer standards in Canada. The conclusion of this work

was that there was an increasing interest in the development of national cancer standards. In 2007, cancer standard development was in the early stages in Canada, but there was a commonly held view that standards were necessary to articulate an expected level of quality and safety for the delivery of cancer services along the cancer continuum.

There was a high degree of variability, diversity and inconsistency in the delivery of cancer programs and services across the nation, and standards were implemented to varying degrees by healthcare providers and facilities.

Guidelines

Guidelines are developed by systematically synthesizing research into meaningful statements that can then guide clinical decision making and the delivery of care. The development of guidelines is a key first step in determining the need to support new practices or treatment based on the evidence, such as systemic therapy drugs. Guidelines do not, however, result in complete uniformity in

clinical decision making. Accommodation of particular patient characteristics, local circumstances and clinical judgment are all factors in customizing an individual's healthcare. Guidelines do, and should, disseminate new or emerging knowledge that relates to treatment decisions.

In Canada in 2007, a variety of groups including national, provincial and professional organizations were focused on the development of cancer guidelines. Other provincial cancer agencies referred to cancer management guidelines developed in other jurisdictions in Canada and the United States. In addition, new methodologies that aided the adaptation and adoption of guidelines were emerging as promising practices for increasing the uptake of guidelines.

In 2007, there was some recognition of duplication of efforts in guideline development for drugs, and the JODR process was established as a means of reducing duplication and streamlining the guideline development process used to inform drug funding decisions.

In 2005, Cancer Care Ontario disseminated the Thoracic Surgical Oncology Standards, which detailed the optimal conditions for delivering cancer-related thoracic surgery in the province. The standards were based on evidence and expert consensus and included surgeon criteria, hospital criteria and expected minimum numbers of surgery performed, based on the relationship reported in the literature between the number of thoracic surgeries performed in a centre and improved patient outcomes. Based on the application of these standards, it will be possible in coming years to assess if any differences in patient outcomes are attributable to the standards.

In the early 1990s, the Canadian Breast Cancer Initiative represented a comprehensive Canadian effort to develop cancer treatment guidelines at a national level. By the spring of 2007, while there was no national repository of treatment guidelines, both Ontario and British Columbia were making progress in provincial guideline development processes, and Alberta and Quebec were initiating efforts to establish guideline development capacity for cancer.

Quality Programs

Quality programs and quality assurance are wide-ranging concepts covering all matters that individually or collectively influence the quality of any product or service. The implementation of internal and external quality programs in the healthcare delivery system is central to optimizing patient care and to the safe and efficient delivery of healthcare. Quality programs are essential, given the interdisciplinary nature of cancer care, including prevention expertise, primary care, pathology, medical oncology, surgical oncology, holistic (supportive) care, radiation oncology and end-of-life care.

In the delivery of healthcare, a move over the past decade from viewing quality initiatives as a measure of practitioner competence to the measurement of population health outcomes indicated that the focus of quality programs had shifted in 2007. At the time, attention was focused on identifying priority areas for the development of processes and infrastructure to establish quality initiatives. In Canadian healthcare, there were emerging efforts to integrate the concepts inherent in quality improvement into everyday activities and across all levels of healthcare delivery.

System Performance Reporting

The enhancement of the cancer control system in Canada requires that the performance of the existing system has been measured and reported on. This reporting allows the identification of areas that warrant special attention and allows lessons to be learned from areas that have had particular success. System performance indicators capture key dimensions of health (such as how many people are diagnosed with cancer), the healthcare system (such as how many patients receive treatment within a set amount of time) or other related factors. They make it possible to measure and report on the status of the system, how it is meeting the needs of Canadians and what needs improvement. The systematic reporting of performance indicators was a relatively new phenomenon in 2007, with emerging methodologies but no definitive approach in place for cancer control in Canada.

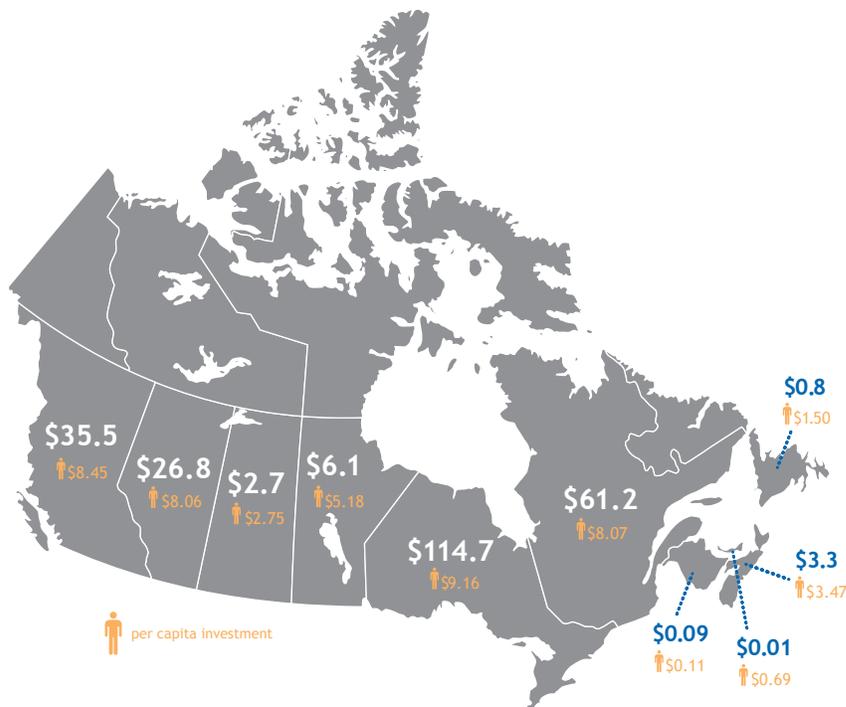
Research

By 2007, Canadian cancer researchers had achieved considerable advances in the understanding of how cancer works and had made contributions to progress in all components of the cancer control continuum.

Prior to 2007 there was a recognized gap in information about the level of cancer research investment by governmental and voluntary sec-

tor organizations in Canada. An initiative was underway delineating the level of cancer research funding for the year 2005. The early phases of this work did not include information from all the main organizations funding cancer research, but what was known in 2007 was that \$253.6 million was invested by 19 organizations (two federal, 10 provincial, four voluntary and three multi-partnered initiatives) in Canadian cancer research (Figure 15).

FIGURE 15
2005 cancer research investment by province of principal investigator in dollars and per capita investment (\$253.6),* in millions of \$



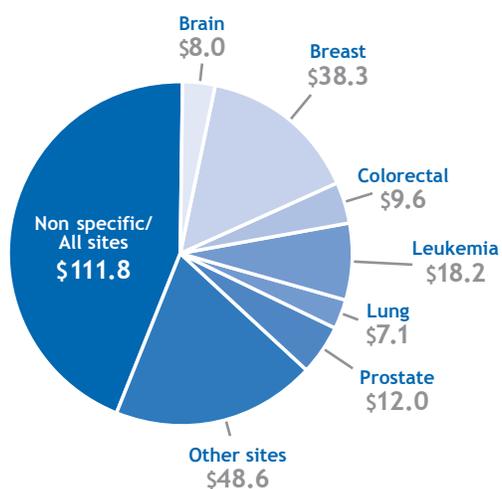
Source: Canadian Cancer Research Alliance (CCRA).

*Excludes \$2.4M invested in awards to trainees studying outside Canada.

Research focused on understanding how cancer starts and progresses received \$115.3 million of the investment. There was \$56.8 million invested in research targeted at the development and testing of cancer treatments, while research aimed at identifying the causes or origins of cancer was funded with \$25.2 million. Prevention intervention research comprised less than 2%, with a \$5.8 million investment.

More than half of the research investment in Canada at that time was for research that addressed common aspects of many cancers. The largest cancer site-specific investment was in breast cancer research, which reflected a commitment to addressing the leading form of cancer in Canadian women (Figure 16).

FIGURE 16
2005 Cancer research investment by cancer site (\$253.6), in millions of \$



Source: Canadian Cancer Research Alliance (CCRA).

Prospective Studies

A prospective **cohort** provides a wealth of information about a group of people who are followed in real time, in high enough numbers and over a long enough time period (often 20 to 30 years) to allow researchers to notice and document any associations between diseases, preventive measures or programs, risk factors and outcomes.

By 2007, the benefits of a Canada-wide cohort had been seen as important by federal and provincial governments, although few jurisdictions had taken steps to initiate such research. From consultative forums held within the cancer control community during 2006 and into 2007, strong support was voiced for a substantial population platform to allow researchers to study a wide range of possible causes of cancer, including lifestyle, genetics, environmental exposures and the interactions among these possible causes. The success of the Alberta Cancer Board’s Tomorrow Project where 24,000 Albertans had been enrolled by February 2007⁵³ and a commitment by organizations from other provinces suggested that timing was right to initiate a larger-scale pan-Canadian effort. The vision was to expand the cohort study by linking existing or new cohorts from different Canadian jurisdictions using common data sets and protocols.

Translational Research

Translational research transforms scientific discoveries from laboratory, clinical or population studies into clinical applications that have the potential to reduce cancer incidence, morbidity and mortality. The concept unites researchers across disciplines and jurisdictions to address important clinical problems in cancer prevention, diagnosis and treatment, with an emphasis on providing measurable improvements in patient care with improved timeliness. Recognition of the need for translational research is not unique to Canada nor unique to cancer, and it became an important focus within many health research areas. In Canada, it was not possible to quantify the level of investment in translational research in 2007, but it was likely dwarfed by the investment made in discovery research.

Knowledge Management

Knowledge management includes a commitment by organizations to ensure that information is used to inform decisions by capturing key lessons from past experiences in a systematic way. This is achieved through capacity building, creating a culture of knowledge management across organizations, communities of practice or jurisdictions, and providing the technology and tools necessary

to aid these processes. The purpose of knowledge management in cancer control is to ensure that the most up-to-date evidence and knowledge is available to the cancer control community, enabling collaboration, shared learning and evidence-based decision making.

Most stakeholders felt it was difficult to spread knowledge of best practices across the country, share lessons learned from experiences and optimize the use of existing cancer data sets to better inform decisions. Knowledge translation is a broad concept, encompassing the many steps between the creation of new knowledge and its application to result in beneficial outcomes. While knowledge translation was recognized as an important element of translating research results into practice, little knowledge translation was actually taking place in Canadian cancer control.

Knowledge management and translation is based on data that is synthesized to produce sound evidence. In 2007, while sources of data were many, they were disparate and the capacity for monitoring cancer trends in populations varied across the country. It was recognized that, although Canada held many good sources of cancer data, they were not being used to the fullest extent possible.



A Framework for Cancer Control: Challenges in 2007

A fundamental challenge in the framework for cancer control was the lack of a coordinated, systematic approach to implementing and measuring progress in the components of the framework across Canada. In the area of knowledge management, for example, the problem was not a shortage of information, but rather the fact that there was no single point of access for the information.

The area of guideline development was being addressed by professional bodies (e.g., practice guidelines), while the area of cancer standards had seen activity in a wide range of disciplines and clinical areas. Those groups working in guideline and standard development and implementation lacked a mechanism or process for integration of efforts, and so there was no comprehensive inventory of cancer standards or guidelines across Canada in 2007. Gaps existed in the uptake of standards, guidelines and protocols and the evaluation of their effectiveness.

Over the two decades predating 2007, there had been a significant increase in understanding of

the biological and molecular processes involved in cancer. However, this increased knowledge of cancer had not led to a proportional increase in new interventions for cancer at that time.

The use of technology as an enabler was not optimal in 2007. Such innovations as making information more accessible in synthesized formats would have supported collaboration for the purposes of knowledge sharing and embedding evidence (such as guidelines) at the point of care. While the concept of an electronic health record was supported across Canada, it had not been developed, and this therefore represented a gap in availability of enabling technology.

The full utilization of available data was a challenge at the time and the need to enhance data sources in the areas of staging, patterns of care and survivorship was recognized. As well, there were increasing challenges in appropriately implementing privacy policies and legislation that protected individual rights to privacy, while facilitating research, and allowing the analysis of in-depth patient information.

Challenges in Canadian Cancer Control 2007

There were strengths in the Canadian cancer control system in 2007 including rich and deep sources of data available through the cancer registry system, administrative and other health service information systems. Strong leadership existed in provincial cancer agencies and programs, with a will to work towards an integrated and enhanced cancer control system and to drive quality improvement in the cancer healthcare system. Canada had a solid foundation of well-established treatment systems and guidelines, but like other countries, Canada also had challenges to face and gaps that existed in cancer control. While the national strategy for cancer control was in place, there was a need for a coordinated Canada-wide approach to implementation that would bring partners together so that strengths and efficiencies could be maximized across the nation.

There was room for improvement in defining care on either end of the cancer continuum. As well, recognizing the complexity of cancer care, there were challenges that existed in providing an integrated and well-coordinated system of care that was person-centred, supportive and accessible to all Canadians. The cancer control needs of vulnerable populations, including but not limited to multicultural, rural/remote and aboriginal, were not being adequately met. The challenges that existed were disparate and required interventions that were targeted at the needs of particular populations.

In the 1990s, the population of Canada had grown steadily and the proportion of the population who were elderly increased. In general, the elderly use health services more heavily than younger individuals and those over age 55 are more likely to be diagnosed with cancer. In 2002 it was estimated that demand for health services had increased by 1.5% per year throughout the 1990s because of a combination of population growth and population aging. These trends in demography plus other factors including health status, technology, practice patterns and the organization and delivery of health services all influenced the determination



of the right number of health care providers and the right mix of skills and training that would be needed in the future. In early 2007 emerging information showed that the average age of health care workers was increasing overall, and that approximately 13% of Canada's nursing workforce would have retired within the previous year. Planning for health human resources presented a significant challenge to the cancer control community in Canada at this time.

Transforming data into information and then disseminating that knowledge in a way that could inform the public, policy and clinical decision making was challenging in 2007. The chain of activity from data collection through to knowledge dissemination took too long in 2007. While there were numerous rich data sources in existence, the ability to easily identify relevant datasets and to link these datasets to provide meaningful information was lacking.

Various provinces had differing areas of focus on different aspects of cancer control, and there was a need to actively pursue a national whole

population and full disease continuum approach to cancer control. Further collaboration between national, provincial and territorial efforts was needed to better leverage and coordinate cancer control activities.

The field of knowledge exchange had the potential, with further development, to increase access to evidence. Such evidence would provide opportunities for researchers, practitioners and policy-makers to learn from the evidence and from each other. As an extension of the development of knowledge exchange, there was a lack of patient and family education in 2007 that would serve to greatly enhance the decision-making capabilities of individuals and enhance well-being.

The overarching challenge in Canadian cancer control was a need to integrate all aspects of patient care across the continuum and between multiple disciplines, to collect and link health and health services data across the continuum of that care and to coordinate a complex healthcare system across federated jurisdictions with differing capacities, needs, profiles and populations.

An Integrated Plan to Bring the Canadian Cancer Control Strategy to Life

The Canadian Strategy for Cancer Control was developed over a decade and presented to government in 2006 by a broad multi-stakeholder group of Canada's leading cancer organizations. Together, they created an innovative strategy and five-year business plan to address the number of deaths and new cancer cases in Canada and to minimize the social and economic impact of cancer.

Understanding the imperative to act on cancer control, the government of Canada announced funding for the Canadian Partnership Against Cancer (the Partnership) in November 2006. In April 2007, the Partnership began operations as an independent, non-profit organization with a \$250-million, five-year mandate to oversee implementation of the Canadian Strategy for Cancer Control.

The strategy is meant to address the need for integrated planning and care and provide a mechanism for coordinating action, sharing learning

and distributing best practices to policy-makers, health professionals, patients and the community at large. It will ensure that Canada is prepared to deal with the increasing burden of cancer as Canada's population ages.

The strategy is based on the development, translation and transfer of knowledge and expertise across Canada. New knowledge will be created through research, while existing knowledge will be consistently and effectively applied. The result will be reduced fragmentation in the healthcare system, the use of evidence-based best practices, informed decision making and measurable improvements in the health of Canadians.

While supporting and respecting provincial jurisdiction over healthcare, the strategy encourages, supports and facilitates collaborative initiatives within the cancer continuum. This community includes federal, provincial and territorial representatives, health professionals, non-governmental organizations and cancer patient and survivor groups.



ANADIAN PARTNERSHIP
AGAINST CANCER



PARTENARIAT CANADIEN
CONTRE LE CANCER



The strategy's approach permits a national perspective by enabling comparability, transparency, consistency and portability of knowledge across Canada. By bringing together all partners in the Canadian cancer control system, the strategy will enable governments and cancer care organizations to achieve a more efficient alignment of cancer control resources that will save lives, reduce suffering and add economic value.

The main goals of the strategy are to:

- reduce the expected number of cancer cases;
- enhance the quality of life for those affected by cancer;
- lessen the likelihood of Canadians dying from cancer; and
- increase effectiveness and efficiency of the cancer control domain.

The strategy has identified five initial priority areas for immediate investment:

- cancer prevention and early detection;
- supporting the cancer patient's journey;
- supporting the cancer workforce;
- encouraging cancer research; and
- improving cancer information and access.

The Partnership provides a mechanism for coordinating action, sharing learning and disseminating best practices to policy-makers, health professionals, patients and the community at large. It will ensure that Canada is prepared to deal with the increasing burden of cancer in Canada's aging population.

At the beginning of its first year, the Partnership refined a five-year strategic plan that includes a breadth of activities and outcomes throughout the cancer control continuum. That plan maintains the priorities set out in the Canadian Strategy for Cancer Control. It also sets out specific targets to be achieved by the end of the Partnership's first mandate, in 2012. Among the targets is to publish reports on 24 indicators of cancer control. This report is the first step in attaining this goal.

The world of cancer control is dynamic and requires adaptability and responsiveness. As new information becomes available, the Partnership will adjust its strategy as necessary. It will continue to report to Canadians on its progress and on the progress of cancer control in Canada.

For more information about progress to date in implementing Canada's cancer control strategy, please visit www.partnershipagainstcancer.ca or www.cancerview.ca.

Understanding the Report

Glossary of Terms

Age-standardized rates

These refer to an average of age-specific rates that has been weighted using a standard population distribution. The reason for using age-standardized rates is that they reflect the overall numbers that would be expected if the population of interest had an age structure identical to the standard population in Canada. They are used to compare cancer rates and trends over time, among populations. In this report, the 1991 Canadian population is used as a reference.

Asymptomatic

Without symptoms.

Body Mass Index (BMI)

Body Mass Index (BMI) is an index of weight-for-height that is commonly used to classify underweight, normal, overweight and obese adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). For example, an adult who weighs 70 kg and whose height is 1.75 m will have a BMI of 22.9. ($\text{BMI} = 70 \text{ kg} / (1.75 \text{ m})^2 = 70 / 3,0625 = 22.9$). The World Health Organization defines a BMI of less than 18.5 as underweight, 18.5 to 24.99 as normal, 25.0 to 29.99 as overweight and 30.0 and over as obese.

Cancer control

Cancer control involves the entire population. It is not limited to those who have been diagnosed with cancer and are being treated within the cancer care system. Rather, cancer control spans prevention, screening, education, research, treatment, supportive care and surveillance (the gathering and analysis of data related to cancer).

Carcinogens

This refers to any substance that is known to cause cancer (e.g., asbestos, tobacco).

Cohort

Refers to a group of people from a specified population – defined by experiencing an event (typically birth) in a particular time span.

Collaborative stage

This is a mechanism to establish the stage of cancer in a more comprehensive way, through the use of trained health information specialists who collect standardized, disease site-specific sets of data elements from the patient information, which are then compiled to derive stage.

Diagnosis

This refers to the act of identifying a disease from its signs and symptoms. Diagnosis is often made by a physician and usually occurs through the synthesis and interpretation of information from several sources (e.g., physical examination, diagnostic radiology or biopsy).

Hypotheses

A set of tentative assumptions made in order to draw out and test their logical or empirical consequences. Hypotheses normally form the basis of research studies, articulating the “research question” the study sets out to answer.

Incidence

The number of newly diagnosed cases (in this case cancer) during a specified period of time (usually the number of new cancers diagnosed in a year).

Invasive cancer

This refers to any cancer that has the ability to spread beyond where it originated.

Life table

These tables show for people at different ages the probability that they will die before their next birthday. These tables help to calculate the remaining life expectancy for people at different ages, the proportion of people born in a specific year still alive and the probability of surviving any particular year of age in Canada.

Mortality

The number of deaths (in this case due to cancer) during a specified period of time.

Oncogenic

An agent, environment, process, or substance that causes tumours, or that is known to have a direct causal link with their development.

Palliative care

Palliative care refers to the holistic care of people with advanced progressive illness (in this case, cancer), aimed at management of symptoms and quality of life. Management of pain and other symptoms and the provision of psychological, social and other support are key elements. Palliative care aims to ensure the best quality of life for patients and their families.

Potential Years of Life Lost (PYLL)

The number of years of life lost when a person dies prematurely from any cause. PYLL is calculated by subtracting the age at which a person dies from the life expectancy (from the life table at the time in Canada).

Prevalence

The number of people alive at a specific point in time with a specific condition (in this case cancer) is referred to as prevalence. Prevalence can sometimes relate to a specific diagnosis time period (e.g., this report generally examines the number of people diagnosed within the last 15 years).

Rate

The number of cases (or deaths) that occur in a specified population per year (e.g., the number per 100,000 people in a province with a new diagnosis of cancer).

Screening

The early detection of a disease, or identifying the precursors of the disease, or the likelihood of developing a disease in people who have no symptoms of that disease.

Staging

The stage of a cancer refers to the extent that it is found within the body. If the cancer has spread, the stage describes how far it has spread from the original (primary) site to other parts of the body.

Surveillance

The ongoing, systematic collection, analysis and interpretation of health-related data.

Notes

In this report, the term “cancer” is used throughout to describe invasive cancers, unless otherwise specified, and does not include information for non-melanoma skin cancer, which although diagnosed often in Canada, is generally not life threatening and is not usually included in cancer registry data or reports.

Across Canada, there is a lag between the time of a disease event (e.g., diagnosis, staging, initial treatment) and when data are available and published. In 2007, therefore, the status of cancer control was generally reflective of data that were available up to and including about 2003, with some kinds of data available up to 2005 or 2006. These are the data in this report.

The data sources used in this report include:

Canadian Cancer Society, *Cancer Statistics, 2007*

- the number of Canadians diagnosed with cancer in 2003
- the number of Canadians who died from cancer in 2003
- potential years of life lost in 2003
- prevalence of Canadians diagnosed and living with cancer in 2003

Canadian Institute for Health Information

- *data on health care providers, 2002, 2005*

Health Canada

- economic burden of cancer – *Economic Burden of Illness in Canada, 1998*

Statistics Canada

- data on obesity, Pap and PSA testing, mammograms – Community Health Surveys, 2003, 2005
- data on Canadians’ sun exposure – Sun Exposure Survey, 1996

Sometimes rates or actual numbers are provided in the report. Each of these serves a different purpose. Rates give the ratio of people affected as a proportion of the population. This provides the reader the ability to see an issue within the context of a population. In this report, the rate of number of people per 100,000 population is used. Actual numbers are needed to understand how many people in Canada are affected by cancer and are required so that the people planning the healthcare system have the information they need about actual numbers of people who may need service.

When trends in rates and actual numbers are examined, the analysis must be done within the framework of demographic changes in the population over time. Between 1996 and 2005, the Canadian population changed. There were changes in the composition of the Canadian population by age group. For those 19 years of age and younger, the population was relatively stable, with a decrease of about 2%. For the young adult group (20 to 39), the Canadian population decreased by 3.4% during the decade, while the age group between 40 and 59 years increased by 29%. At the upper end of the age spectrum, the number of Canadians aged 60 years and older increased by 20% during this time period.

The importance of different types of cancer and how they affected Canadians in 2007 can be measured in several ways. Incidence is described as the number or proportion (rate) of new cases of a particular kind of cancer, or cancer overall, that are diagnosed each year. Prevalence refers to the number of people or proportion of people in the entire population who are found with a defined disease, at a specified point in time (in this case cancer). Mortality is expressed as the number or proportion of deaths that are attributed to a specific kind of cancer in each year.

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