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PROGRESS REPORT  
on CANCER CONTROL  
in CANADA



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**P R O G R E S S R E P O R T**  
**o n C A N C E R C O N T R O L**  
**i n C A N A D A**

**Centre for Chronic Disease  
Prevention and Control**

**Population and Public Health Branch**

**Health Canada**



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# EXECUTIVE SUMMARY

## Why a Progress Report?

The *Progress Report on Cancer Control in Canada* is the first national report of its kind, offering Canadians a comprehensive overview of how Canada is doing in the fight against cancer. Its purpose is to raise overall awareness of cancer issues among general readers and to focus public attention on key issues related to cancer control and care in Canada. The report also aims to help health policy makers understand past efforts in cancer control, enabling them to apply lessons learned to better allocate health resources and to better determine the most appropriate strategies for cancer control in Canada.

## How was the report developed?

The report was developed by Health Canada in close collaboration with key cancer stakeholders from across the country and is based on the most recent data available from Health Canada's Population and Public Health Branch, Statistics Canada and other federal and provincial agencies, non-government organizations and cancer researchers.

## What are the goals of cancer control?

Cancer control aims to prevent cancer, cure cancer, reduce the suffering associated with cancer and increase survival and quality of life for those who develop cancer. It does this by converting knowledge gained through research, surveillance and outcome evaluation into strategies and actions.

## Who is involved in cancer control in Canada?

There are many organizations involved in cancer control in Canada. They include federal, provincial and local governments as well as non-governmental organizations such as the Canadian Cancer Society, the National Cancer Institute of Canada, and community groups. The majority of frontline cancer control programs in Canada are developed and run by provincial cancer agencies.

Since 1999, Health Canada has been working in partnership with the Canadian Association of Provincial Cancer Agencies, the Canadian Cancer Society and the National Cancer Institute of Canada and other stakeholders to develop the

# EXECUTIVE SUMMARY

*Canadian Strategy for Cancer Control (CSCC).* The Strategy seeks to optimize the benefits of current knowledge and available resources for cancer control, while enhancing the sustainability of the health care system through more collaborative planning, priority setting, public policy development and implementation. Integration and coordination of activities under the CSCC is expected to help reduce cancer incidence, morbidity and mortality rates and enhance the quality of life for those living with cancer.

## **How is Canada doing in the battle against cancer?**

In order to understand how Canada is doing in the battle against cancer, it is necessary to understand the nature of cancer itself. Cancer is not one but many related diseases characterized by uncontrolled cell growth. Some cancers are slow-growing, while others are highly aggressive. Some types of cancer are highly treatable, while others are almost uniformly fatal.

The divergent and complex nature of cancer makes progress in cancer control an ongoing challenge. As this report indicates, Canada's response to this challenge has been generally positive, with significant progress being measured

over the past 15 years. Small declines in mortality rates for cancer among both men and women have been observed since the late 1980s, primarily as a result of decreasing mortality rates from breast, prostate and colorectal cancer. Perhaps the most important progress has been the falling prevalence of cigarette smoking. This has led to declining lung cancer rates in males, and it is anticipated that similar declines for females will be observed within the next decade.

Progress in these areas may be attributed to broad social trends as well as to specific cancer prevention initiatives and advances in cancer screening and treatment. Thanks to these combined efforts, Canada's record in cancer control is good. A comparison with other countries reveals that the rate of new cancer cases (incidence) and mortality rates for cancer in Canada are comparable to those of the United States, and that while incidence rates in Canada are higher than those in Western European countries, death rates are, in general, lower, meaning that Canada has better cancer survival rates.

However, despite these positive steps in cancer control, cancer is currently the leading cause of premature mortality in Canada, and is expected to be the leading cause of death within the next

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several years. In 2004, more than 145,000 new cases of cancer are expected to be diagnosed in Canada; these numbers are expected to double by the year 2020 as Canada's population grows and ages. The number of people living with, or having been diagnosed with, cancer is increasing at roughly twice the rate of new cases of cancer.

The obstacles to future progress in the battle against cancer include a failure to fully apply the knowledge gained from past research and the lack of knowledge of how to effectively prevent and treat many cancers. In addition to more and better research, greater emphasis must be placed on cancer prevention, the development of effective early detection and screening programs and the expansion of quality palliative care.

## What are the report's key highlights and observations?

### Prevention

- About one-half of cancers in Canada are preventable, based on our current understanding. Most of the important factors identified to date relate to lifestyle; unfortunately, lifestyles are difficult to change on a population basis.

- Perhaps the greatest success in cancer control has occurred in reducing the use of tobacco. Tobacco is the leading preventable cause of cancer in Canada. Smoking among Canadians has declined by more than one-half over the last one-third of a century. In 1965, 50% of Canadians aged 15 years and older were smokers, compared with 21% in 2002. The reduction in smoking has resulted in important reductions in lung cancer in men, but insufficient time has elapsed for lung cancer rates to begin to decline in women.

- Some successes have also been noted for diet. Canadians are eating more fruits and vegetables, and rates of cancers of the gastrointestinal tract are declining. Unfortunately, Canadians are getting fatter; this is contributing to increases in other cancers.

### Screening

- There are no proven population screening techniques for most forms of cancer.
- Screening for cervical cancer is highly effective at detecting and allowing for the treatment of lesions before they become cancerous. In Canada, the large reduction in death rates from cervical cancer over the last 30 years is

# EXECUTIVE SUMMARY

believed to be primarily the result of cervical cancer screening. The proportion of Canadian women who report having had a Pap smear test within the previous three years has remained stable over the last seven years at about 73%.

- Regular screening mammograms reduce the chance of dying from breast cancer among women aged 50 to 69 years by about 30%. Approximately 50% of Canadian women in this age group reported having received screening mammography in the previous two years in both the 1994–1995 National Population Health Survey and the 2000–2001 Canadian Community Health Survey.
- Although screening trials have demonstrated that fecal occult blood tests can reduce colon cancer mortality by 20%, there has been limited adoption by the public, and no province has initiated a population-based screening program.
- There is widespread use of the Prostate-Specific Antigen (PSA) test for prostate cancer screening, but researchers are still waiting for the results of several ongoing screening trials to indicate whether PSA screening is effective.

## Treatment

- Over the last several decades, many billions of dollars have been spent internationally to investigate the cellular and molecular basis for cancer, with the ultimate intention of improving cancer treatments. Unfortunately, with some notable exceptions for some rare cancers, progress in cancer treatment has been modest. Improvements in survival have been limited far more by the lack of new, effective therapies than by an inability to deliver current therapies in a timely, comprehensive fashion.
- In addition to more research into better treatments, there is an urgent need for coordinated planning for future human resources and for increased numbers of training positions, along with improved retention and recruitment strategies. Several provinces have moved or are moving toward cancer agency-based comprehensive cancer control programs.
- The large volume of new and sometimes conflicting information on best practices in cancer control has placed greater emphasis on systematic reviews of research evidence and the development of clinical practice guidelines. Several provinces are actively collaborating on clinical practice guidelines as well as protocols for chemotherapy.

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## **Palliative care**

- Most palliative care in Canada is provided to patients diagnosed with cancer. Strategies for supporting and sustaining effective palliative care services will become increasingly important as Canada's population grows and ages.
- Some institutions and home care services incorporate palliative care services into cancer care, but overall, this area remains underdeveloped. Where these programs exist, they are increasingly integrated across a variety of institutional and community-based health care settings and offer a comprehensive range of services, including relief from pain and other symptoms, psychological and spiritual care, a support system to help patients live fully until death, and support for families.

## **Future challenges**

While the report highlights obstacles to progress in cancer control, it underscores the fact that Canada has, in several areas, responded well to the cancer challenge. Nonetheless, as identified by the Canadian Strategy for Cancer Control, Canada's approach to cancer control needs to encompass increased recognition of the value of health promotion and disease prevention, a

greater commitment to broader integration of cancer control activities through better national and provincial planning, the promotion of greater participation in effective screening programs, use of evidence-based guidelines to inform clinical care and service delivery and an awareness of the value of palliative care and the need to increase palliative care capacity as our country's population grows and ages.

# INTRODUCTION

Cancer is the leading cause of premature death in Canada. In 2004, an estimated 145,500 new cases of cancer will be diagnosed in Canada: 74,800 in males and 70,700 in females. The proportion of all deaths attributable to cancer has increased steadily over the last 80 years, from 7% in 1921 to 29% in 2000. It is estimated that the number of cancer deaths will surpass those from heart disease by 2006.

## Why is a Progress Report needed?

This Progress Report summarizes cancer issues and cancer-related policies, programs and strategies across the country to help determine how well Canada is doing in its fight against cancer. Based on the most recent data available from Health Canada's Population and Public Health Branch, Statistics Canada and other federal and provincial agencies, non-government organizations and cancer researchers, the report identifies trends and patterns in cancer incidence. It also highlights key issues related to progress (or lack thereof) in cancer control and care in Canada, and offers observations and conclusions aimed at improving the overall quality and efficiency of cancer control in all jurisdictions across the country.

## Cancer control objectives

Cancer control aims to prevent cancer, cure cancer, reduce the suffering associated with cancer and increase survival and quality of life for those who develop cancer. It does this by converting knowledge gained through research, surveillance and outcome evaluation into strategies and actions. Cancer control initiatives are divided into four key activity areas: prevention, screening, treatment, and supportive/palliative care.

## What's in this report?

*The Progress Report on Cancer Control in Canada* is divided into six chapters: an overview of Cancer Control in Canada; Prevention; Screening; Treatment; Palliative Care; and Conclusions and Future Directions.

## Cancer Control in Canada

This chapter offers a brief history of cancer control programs in Canada, a description of recent developments toward a population health approach to cancer prevention and a description of current efforts toward greater integration of cancer control activities across the country.

It provides information on trends in cancer incidence and mortality in Canada and compares Canada's efforts in cancer control with those of other countries. This chapter's key message is that Canada has made some initial steps towards systematic progress in cancer control with the development of the comprehensive and highly collaborative Canadian Strategy for Cancer Control (CSCC).

### **Cancer Prevention**

The information in this chapter deals with behaviours that cause or prevent cancer, with a primary focus on government efforts in tobacco control. Its key observation is that significant numbers of cancer cases and deaths could be prevented through healthier lifestyles, including healthier diets and regular exercise.

### **Cancer Screening**

This chapter focuses on the use of screening to detect cancers early, when the probability of successful treatment is increased. It highlights the widespread use of both recommended screening tests (Pap tests and mammography for cervical and breast cancer) and screening tests for which there is inadequate evidence (PSA screening for prostate cancer).

### **Cancer Treatment**

This chapter offers insight into current treatment patterns as well as survival and treatment costs. While it emphasizes that cancer treatment and outcomes are improving, it highlights significant shortages in many of the professional and technical disciplines that provide cancer care in Canada and the need to develop more comprehensive clinical practice guidelines for cancer professionals across the country.

### **Palliative Care**

This chapter describes palliative care programs in Canada, as well as information on medical training in palliative care. It underscores the growing importance of palliative care as Canada's population ages.

### **Conclusions and Future Directions**

This chapter highlights the progress to date, and outlines the future needs of cancer control activities in Canada.

# CANCER CONTROL IN CANADA

## **Where have we been, and where are we going?**

In Canada, with few exceptions, the provision of cancer services is a provincial responsibility. Most provincial cancer control programs have developed within provincial cancer agencies. Over time, these agencies have expanded from running specialized treatment facilities to assuming major responsibility for various aspects of cancer control, such as organized breast cancer screening, in their respective provinces. Cancer prevention, and to a lesser extent supportive/palliative care, have traditionally received less attention.

## **The population health approach**

In recent years, federal and provincial health ministries have adopted a population health approach in their efforts to prevent cancer and other chronic diseases, including heart disease, respiratory illness and diabetes. The population health approach aims to improve the health of the entire population and to reduce health inequities among population groups by taking action on a broad range of complex and inter-related “health determinants” that have a strong influence over health. Population health initiatives spearheaded by federal and provincial governments include those aimed at tobacco control, dietary change and obesity reduction,

all of which have major implications for the battle against chronic diseases in Canada.

## **Integration of cancer control activities in Canada**

Cancer control is too complex and broad a challenge for any single jurisdiction or organization to tackle on its own. There has therefore been a tendency in recent years towards integration of cancer control activities in Canada. This trend finds support from the World Health Organization (WHO), which has proposed that cancer control should be managed within the context of a National Cancer Control Program. The WHO defines such a program as “designed to reduce cancer incidence and mortality and improve quality of life for cancer patients, through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation, making the best use of available resources.”

## **Toward a national cancer control program**

In 1990, Health and Welfare Canada and the Canadian Cancer Society co-sponsored a Task Force that developed a plan for a National Cancer Control program in Canada similar to the model proposed by the World Health Organization. In

1999, Health Canada began working in partnership with the Canadian Cancer Society/National Cancer Institute of Canada and the Canadian Association of Provincial Cancer Agencies and other stakeholders to develop the Canadian Strategy for Cancer Control (CSCC).

The CSCC, which now includes representatives of all the major stakeholders in cancer control in Canada, emphasizes the need to plan for the projected increase in the burden of cancer care in Canada resulting from population increases and the aging of the population. The Strategy has identified the following priorities: prevention, guidelines and standards, human resources, research and psychosocial/supportive/rehabilitative, and palliative care.

Further integration of cancer control activities is also evidenced by the creation of the Canadian Association of Provincial Cancer Agencies (CAPCA). CAPCA represents provincial/territorial cancer agencies and programs engaged in cancer control. It helps support the coordination of cancer control matters, and acts as a voice for organized cancer control development and program delivery. Integration across cancer sites is also occurring at the patient advocacy level, as witnessed by the 2002 creation of the Canadian Cancer Advocacy Network (CCAN).

## **How does Canada compare to other countries?**

Nearly one-half of the 167 countries contacted by the World Health Organization in a 2001 survey indicated that they had a cancer control policy or plan. However, relatively few of these countries have comprehensive control programs that include prevention, early detection, treatment and palliative care. In the Americas, Canada is one of only five countries that have drafted comprehensive strategies; the others are Brazil, Chile, Columbia and the United States.

## **Canada versus other developed countries**

The International Agency for Research on Cancer estimated incidence and mortality rates for countries around the world for the year 2000. Overall cancer incidence rates for males are slightly lower in Canada than in the U.S., largely because of lower prostate cancer rates. However, overall mortality rates in males are almost identical in the United States and Canada. In general, incidence rates in males are slightly higher in Canada than in developed countries as a whole, but mortality rates are slightly lower.

Incidence and mortality rates for females were generally higher in Canada than in other

# CANCER CONTROL IN CANADA

developed countries, with the exception of the United States, which had rates that were generally comparable to those in Canada.

## **Canada compared to developing countries**

As with other developed countries, male and female incidence and mortality rates in Canada were much higher than those noted for developing countries. In addition to reflecting a true difference in underlying risk, lower rates in developing countries may also reflect a lack of cancer identification and registration resources in these countries.

## **Cancer incidence and mortality in Canada**

### **Data sources**

In Canada, some provincial cancer registries have been collecting cancer incidence data since the 1930s. A national cancer incidence reporting system was initiated at Statistics Canada in 1969 and was developed into a patient-oriented cancer registry in 1992. Currently, various organizations have been collecting cancer-related information, including provincial and territorial cancer registries, Statistics Canada, Health Canada and the Canadian Institute for Health Information.

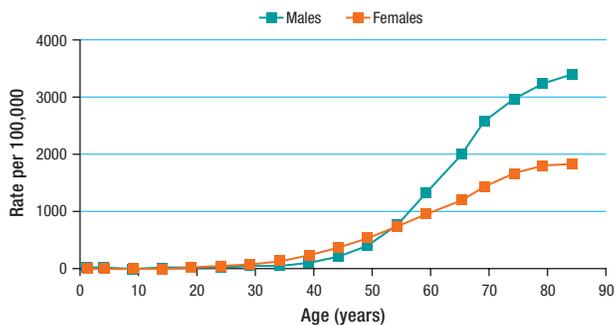
To improve coordination of data collection and provide timely information for cancer control planning and monitoring, a population-based surveillance system for evaluating health determinants, management programs, and the outcomes of cancer is being developed through the Canadian Cancer Surveillance Alliance. The system will be instrumental in the development of prevention-based population health policies and strategies to reduce the burden of cancer in Canada.

### **New cases (Incidence)**

- In 2004, an estimated 145,500 new cases of cancer will be diagnosed in Canada; 74,800 in males and 70,700 in females.
- For the period 1990–2000, the number of new cancer cases increased by 2.5% per year.
- The most common types of cancer are lung, prostate, breast and colorectal cancer. These four cancers combined account for over 56% of new cases of cancer.
- The most frequently diagnosed cancer in women is breast cancer and in men, prostate cancer.
- Cancer remains mainly a disease of older Canadians. In 2000, 58% of all new cancers were diagnosed among Canadians 65 years of age or older. By contrast, only 1% of new

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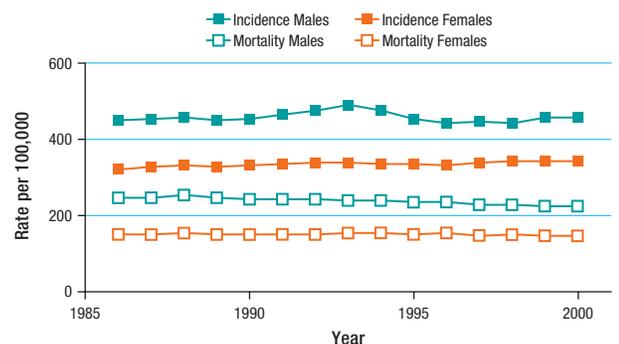
**Figure 1.**  
Age-standardized incidence rates of all cancers, by age group and gender, Canada, 1996–2000



- cases occurred among Canadians under the age of 20.
- For the period 1996–2000, incidence rates of all cancers increased gradually by age at diagnosis, beginning in middle age and increasing more rapidly after age 55, particularly in males (Figure 1).
- Rates at ages 35–54 years were higher in females than males, largely reflecting the impact of breast cancer at these ages.
- In 2000, 62,670 Canadians (33,358 males, 29,312 females) died from cancer, representing 29% of all deaths occurring in Canada during that year. The largest proportion of cancer deaths for both men and women were from lung cancer (29% and 22% of all cancer deaths respectively).

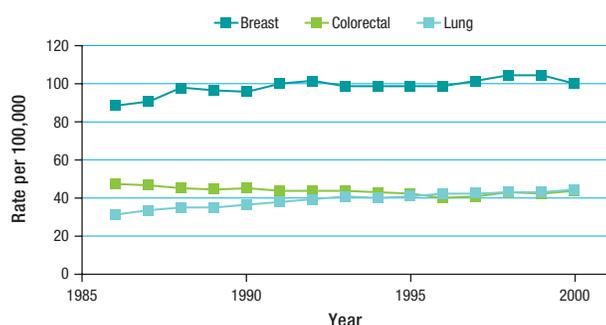
- Breast cancer accounted for 17% of all cancer deaths among women, while prostate cancer accounted for 11% of all cancer deaths among men. Colorectal cancer accounted for 13% of both all male and all female cancer deaths. The top four cancers combined accounted for more than 50% of all cancer deaths in 2000 for both men and women.
- Incidence rates for all cancers in males peaked in 1993, declined until 1996, and have been relatively stable since (Figure 2). In contrast, incidence rates for females for all cancers combined have slowly increased over the last 15 years, reflecting large increases in lung cancer incidence. Incidence rates for most individual types of cancer are declining for both men and women.

**Figure 2.**  
Age-standardized incidence and mortality rates of all cancers, by gender and year, Canada, 1986–2000

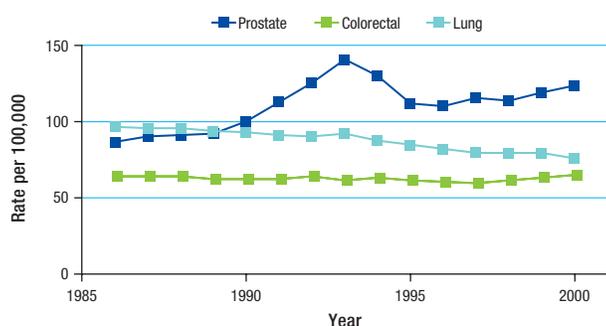


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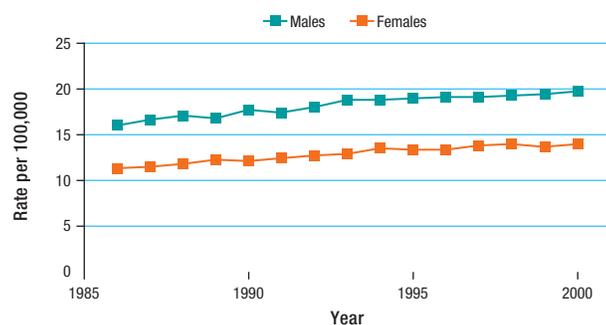
**Figure 3.**  
Age-standardized incidence rates of the most common cancers in females, Canada, 1986–2000



**Figure 4.**  
Age-standardized incidence rates of the most common cancers in males, Canada, 1986–2000



**Figure 5.**  
Age-standardized incidence rates of Non-Hodgkin's Lymphoma, by gender, Canada, 1986–2000



- Breast cancer incidence rates in women increased from the mid-1980s until the early 1990s, but have been relatively stable since (Figure 3). Increases in mid-1980s reflect the widespread adoption of mammography screening during this period.
- The sharp increase in prostate cancer incidence in the early 1990s (Figure 4) corresponds to the introduction of opportunistic Prostate Specific Antigen (PSA) testing in Canada.
- Although incidence rates for most cancers are declining or stable, two exceptions are non-Hodgkin's lymphoma and thyroid cancer. While still relatively uncommon, non-Hodgkin's lymphoma incidence has increased steadily since 1986 (Figure 5). The incidence of thyroid cancer has increased dramatically in the past decade, particularly among women (Figure 6), who are now affected by thyroid cancer about three times more often than men.

## Deaths

The mortality rates for all cancers have declined among both men and women since the late 1980s, from a high of 195.7 per 100,000 in 1988 to 180 per 100,000 in 2000 (Figure 2). This decline is due largely to decreases in mortality rates from breast, prostate and colorectal cancer and lung cancer in males (Figures 7 and 8).

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While lung cancer mortality rates among men are still high, they have declined significantly since the mid-1980s, reflecting a decrease in male tobacco consumption since the mid-1960s (from 60% in 1965 to 23% in 2002). However, female lung cancer mortality rates continue to increase.

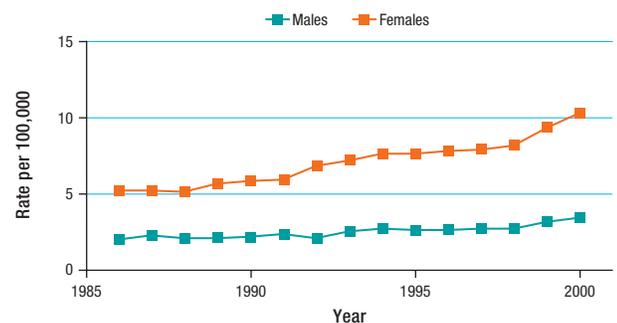
Improved treatment regimens have led to declines in mortality from testicular cancer and Hodgkin's disease, while screening has contributed to a steady decline in cervical cancer mortality.

## Childhood cancer

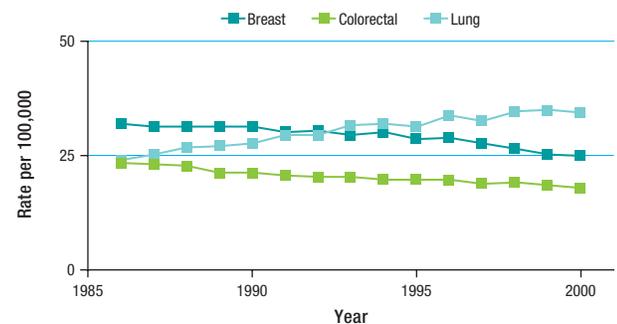
Cancer in children is rare, accounting for only about 1% of all cases. From 1996–2000, an average of 1,289 new cases of cancer were diagnosed per year in children and youths aged 0–19 years. Incidence rates are highest among young children (aged 1–4 years) and adolescents (aged 15–19 years). The overall incidence of childhood cancer has remained relatively stable since 1985, varying from 15.1 to 16.8 per 100,000 children (Figure 9).

The type of cancer diagnosed in children and adolescents differs considerably from adult cancers. While most adult cancers are carcinomas (i.e. cancers that arise in glands and tissues which line organs such as the colon), cancers in children are mainly leukemias (arising from the bone marrow), brain tumours, lymphomas (arising from lymphatic tissues) and sarcomas (cancers

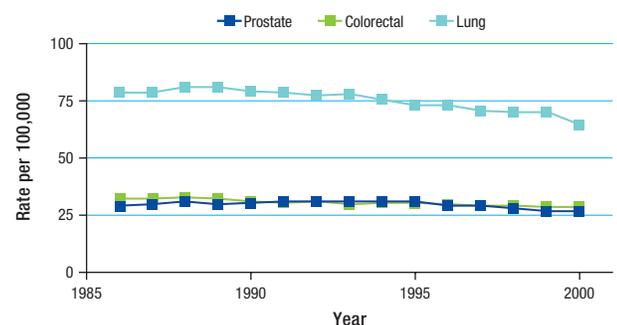
**Figure 6.**  
Age-standardized incidence rates of thyroid cancer, by gender, Canada, 1986–2000



**Figure 7.**  
Age-standardized mortality rates of the most common cancers in females, Canada, 1986–2000

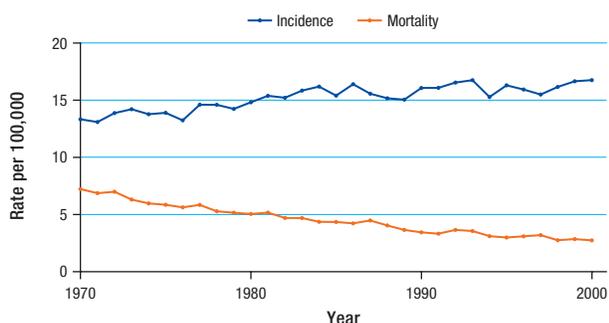


**Figure 8.**  
Age-standardized mortality rates of the most common cancers in males, Canada, 1986–2000

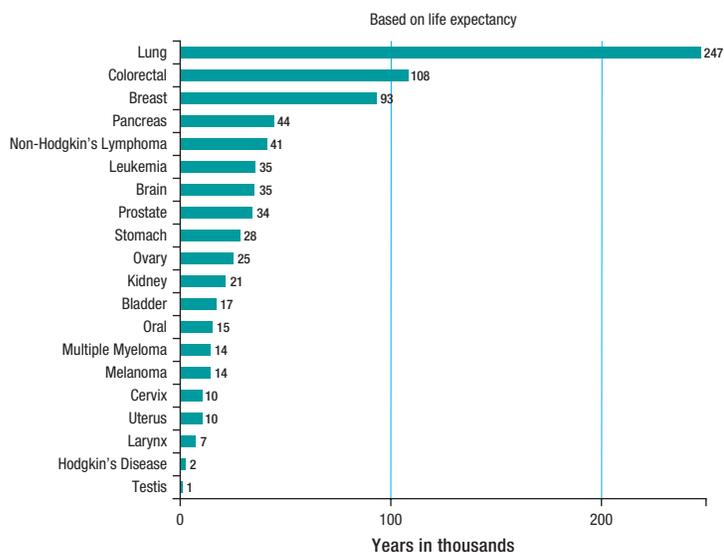


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**Figure 9.**  
Age-standardized incidence and mortality rates for all cancers in children and youth, ages 0–19 years, Canada, 1970–2000



**Figure 10.**  
Potential Years of Life Lost (PYLL) due to cancer, Canada, 2000



found in bones, muscles and connective tissue in certain organs). Leukemia is the most frequent type of cancer diagnosed in children, accounting for 26% of new cases in the period 1996–2000. Cancers of the brain and spinal column are the second most common type, representing 17% of all new cancers, followed by lymphomas, at 16%.

There has been a dramatic decline in childhood cancer mortality (Figure 9). This has been due primarily to treatment advances leading to improved survival, particularly for childhood leukemia. Currently, 80% of children with leukemia are still alive five years after diagnosis, while 40 years ago, survival was uncommon. There has also been improved childhood survival for lymphomas and kidney cancer. In 2000, 218 children and adolescents (aged 0–19 years) died from cancer, representing 6% of all deaths that occurred in that year for this age group.

## Potential Years of Life Lost (PYLL)

In 2000, cancer was the leading cause of premature mortality in Canada. The other two leading causes of PYLL were circulatory and respiratory diseases. Among children, cancer ranked as the sixth leading cause of PYLL.

Lung cancer accounted for 26% of PYLL for all cancers (Figure 10), reflecting the fact that lung cancer is more common and has a lower

# CANCER CONTROL IN CANADA

survival rate than other cancers. Among men, lung, colorectal and prostate cancer together accounted for 48% of PYLL for cancer. For women, 52% of the PYLL is due to lung, breast and colorectal cancers.

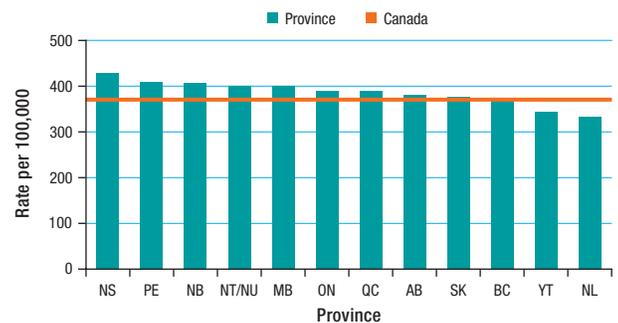
Even though more men die from cancer each year than women, the PYLL due to cancer is higher for women (494,000 years) than for men (460,000 years). This is due primarily to differences in PYLL for breast cancer (93,000 years) compared to prostate cancer (34,000 years); breast cancer occurs at a relatively younger age in women than prostate cancer in men. Some cancers are associated with low PYLL. For instance, Hodgkin's disease has a PYLL of 2000 years, reflecting a cancer that is less common and relatively curable.

## Variations in provincial and territorial cancer rates

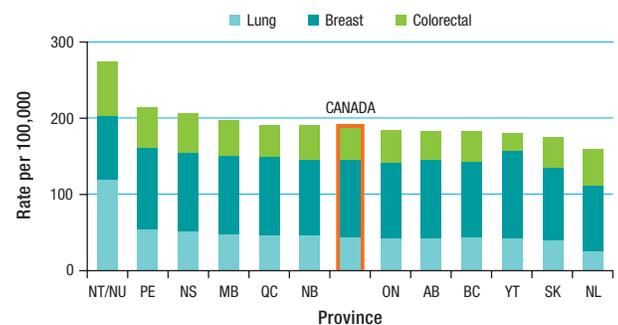
### Incidence

Overall, cancer incidence rates are highest in the east, and lowest in the west (Figure 11). The exception is Newfoundland and Labrador, where low rates reflect the under-reporting of certain types of cancer. Women in the N.W.T./Nunavut had the highest rates of lung cancer, almost double the rate in all other provinces/territories (Figure 12). Women in Alberta, Saskatchewan and Ontario had the lowest lung cancer rates.

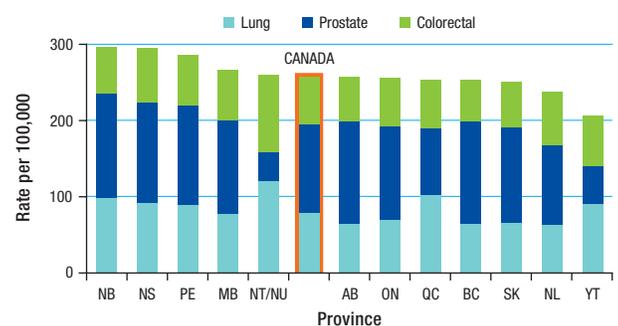
**Figure 11.**  
Age-standardized incidence rates for all cancers, by province and territory, 1996–2000



**Figure 12.**  
Age-standardized incidence rates for the most common cancers in females, by province, 1996–2000



**Figure 13.**  
Age-standardized incidence rates for the most common cancers in males, by province, 1996–2000



# CANCER CONTROL IN CANADA

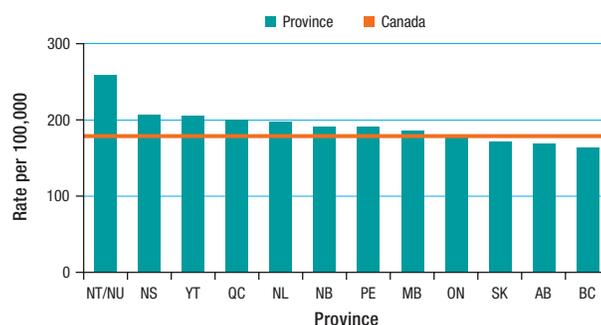
The highest rate of colorectal cancer was also among N.W.T./Nunavut women, while women in the Yukon had the lowest rates. N.W.T./Nunavut women had the lowest rate of breast cancer while the highest rates were found among women in Prince Edward Island, Nova Scotia, Manitoba and the Yukon.

Men from the N.W.T. and Quebec had the highest rates of lung cancer while British Columbia, Alberta and Saskatchewan had the lowest rates (Figure 13). Prostate cancer rates were highest in Prince Edward Island and New Brunswick and lowest in the N.W.T./Nunavut and the Yukon. Men in N.W.T./Nunavut had significantly higher colorectal cancer risks.

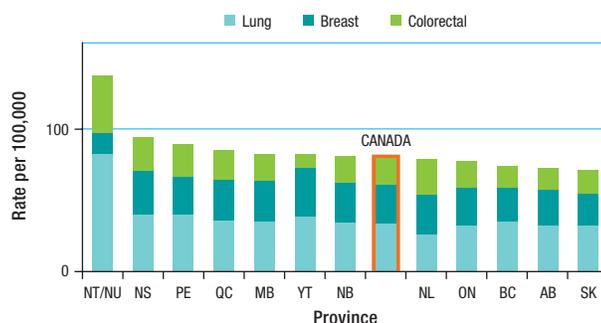
## Mortality

Mortality rates show similar provincial/territorial variations (Figure 14). The highest mortality rates from cancer occurred in the N.W.T./Nunavut for women and in Quebec and the N.W.T./Nunavut for men, reflecting high lung cancer mortality rates (Figures 15 and 16). The N.W.T./Nunavut also had the highest mortality rates in Canada for colorectal cancer, but the lowest rates for breast and prostate cancer. Overall, cancer mortality rates in British Columbia, Alberta, Saskatchewan and Ontario were lower than the national average, while Atlantic provinces were higher than the national average.

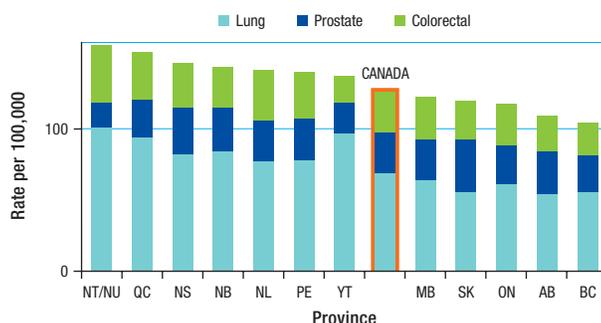
**Figure 14.**  
Age-standardized mortality rates for all cancers, by province, 1996–2000, both genders combined



**Figure 15.**  
Age-standardized mortality rates for the three most common cancers in females, by province, 1996–2000



**Figure 16.**  
Age-standardized mortality rates for the three most common cancers in males, by province and territory, 1996–2000



# C A N C E R P R E V E N T I O N

## The population health approach

Population health is a broad notion of health which recognizes that our overall health and well-being is influenced by a wide variety of health “determinants” that go far beyond traditional indicators such as death, disease and disability. These determinants include: age, biology and genetic make-up, healthy child development, personal health practices and coping skills, culture, gender, health services, physical environments, social environments, education and literacy, income and social status, social support networks and employment and working conditions. A population health approach maintains that collaborative action on these determinants across many areas of Canadian society is the best way to eliminate health inequalities and achieve better health outcomes for all Canadians.

While determinants such as age, biology and genetic make-up cannot be changed, others, such as personal health practices and lifestyle choices, can be modified to produce better health outcomes across populations. Since personal health practices and lifestyle factors play a significant role in determining an individual's chances of developing life-threatening chronic diseases such as cancer, respiratory disease, heart disease and diabetes, population health



includes a focus on promoting healthy behaviours and lifestyles among Canadians. An important part of this preventive approach is the development of initiatives aimed at modifying lifestyle risk factors — such as smoking, drinking, poor diet and lack of physical activity — that are linked to each of these chronic diseases.

Governments at different levels possess various means of influencing these factors. These include: moral suasion with industry and others; building community capacity to support local health programs and coalitions; social marketing; requiring or permitting as appropriate, package labelling outlining risks and/or benefits of the product, regulating the availability and marketing of products; and taxation. Governments help set policies as varied as how many hours of physical education are required in public schools to how bicycle paths are provided in a given neighbourhood.

# CANCER PREVENTION

## **An integrated approach to chronic disease prevention in Canada**

In recent years, there has been a growing trend toward developing comprehensive disease prevention programs across Canada. The Chronic Disease Prevention Alliance of Canada (CDPAC) is an example of this trend. Founded in 2001, the CDPAC is a network of organizations and individuals who share a common vision for an integrated system of chronic disease prevention in Canada; Health Canada is a major supporter. More information on CDPAC can be obtained from: <http://www.cdpac.ca/>

In line with this trend toward greater integration, the 2002 Standing Senate Committee on Social Affairs and Science (Kirby Commission) recommended the implementation of a national, integrated chronic disease prevention strategy which would be comprehensive, sufficiently resourced and sustainable, and would integrate research, policies and programs for maintaining health and preventing chronic diseases. This approach would go beyond the traditional health sector to act on health determinants in sectors such as transportation, education, social services and recreation.

In the meantime, Health Canada and the provincial and territorial health departments and their

partners are developing an integrated Pan-Canadian Healthy Living Strategy. This strategy seeks to use public policy to influence social, economic and physical environments to help support Canadians in making positive healthy choices. The initial focus is on promoting healthy eating and physical activity and their relation to healthy weight.

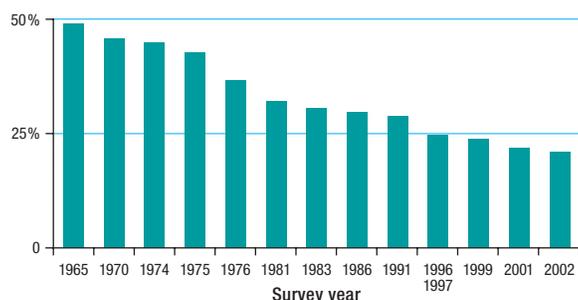
## **Cancer risk and personal health practices and behaviours**

The following section describes what is currently known about the association between cancer risk and personal health practices and behaviours such as cigarette smoking, diet, physical inactivity, obesity, alcohol and sun exposure.

### *Tobacco*

Tobacco smoke contains over 4,000 chemicals, at least 60 of which are carcinogens. Tobacco use has been linked to cancers of the lung, lip, mouth, pharynx, larynx, esophagus, stomach, pancreas, kidney and bladder. Tobacco use also increases the risk of colorectal, cervical, and possibly breast and liver cancer and multiple myeloma. Smoking accounts for about 30% of all cancers (excluding non-melanoma skin cancers) and cancer deaths in Canada.

**Figure 1.**  
Percentage of current smokers in Canada, aged 15 years and over



Source: Labour Force Survey Supplement, 1965–1975, 1981–1986; Canada Health Survey, 1978; General Social Survey, 1991; Survey on Smoking in Canada, 1994; National Population Health Survey 1996–1997; Canadian Tobacco Use Monitoring Survey (Annual), 1999–2002

### Prevalence of smoking across Canada

Smoking among Canadians has been slowly declining over the last 35 years. In 1965, 50% of Canadians aged 15 years and older were smokers, compared with 21% in 2002 (Figure 1).

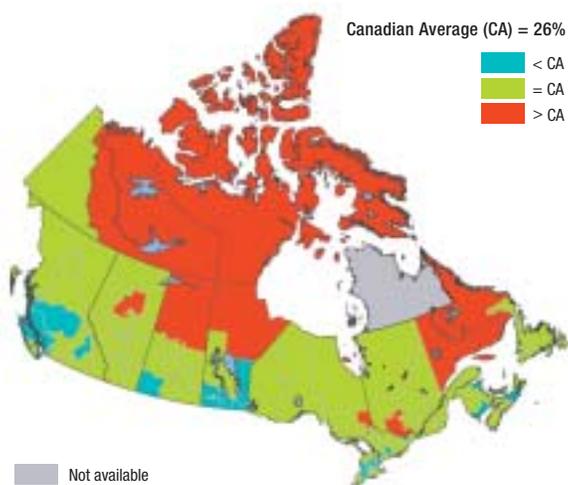
Over the last decade, the largest absolute declines in the proportion of the population who smoke were observed for British Columbia, Alberta, Newfoundland and Labrador, and Nova Scotia (although rates in Alberta, Newfoundland and Labrador, and Nova Scotia still exceed the national average). Currently, the proportion of the population who smoke is highest in the North West Territories, Quebec and northern regions of the Prairie Provinces, and lowest in British Columbia (Figure 2).

The reduction in smoking among men has resulted in important reductions in their lung cancer incidence and mortality (Figures 4 and 8, Chapter 1). Lung cancer rates have not yet declined among women, but are expected to do so within the next decade.

### Smoking among Canada's Aboriginal population

Smoking among Canada's Aboriginal population is more than twice as common as among Canadians as a whole. In 1993, smoking prevalence among Inuit was 72%, almost three times that of the Canadian population. Smoking rates

**Figure 2.**  
Proportion of population aged 12 years and over who are current smokers, 2000–2001



Source: Canadian Community Health Survey

# CANCER PREVENTION

among Aboriginal youth are also high: 54% of 11- to 19-year-olds and 65% of 20- to 25-year-olds smoke. Use of chewing tobacco and snuff is also much higher among Inuit than among other groups in Canada.

## **Smoking initiation rates**

Most people who smoke begin smoking as teenagers. Starting to smoke during early adolescence is associated with higher daily cigarette consumption and a lower probability of quitting, compared with smokers who begin smoking at older ages. It is unusual for smokers to start the habit as adults.

The age at which individuals begin to smoke is relatively consistent across Canada. The majority of Canadians begin smoking between the ages of 15 and 19. Nunavut is the exception, where almost 20% of smokers began to smoke before age 12, as compared to 8% for the rest of Canada.

## **Smoking cessation rates**

Over 20% of those who had identified themselves as smokers in the NPHS survey of 1994–1995 reported that they had quit smoking by the time

of the 2000–2001 NPHS survey. Although tobacco is highly addictive, efforts to encourage quitting have been relatively successful. Declines in smoking prevalence have been most dramatic among older Canadians. In 2001, the number of former smokers in Canada aged 25 and older (5.6 million) exceeded the number of current smokers in the same age category (4.3 million).

## **Declining daily smoking rates**

The average number of cigarettes smoked per day among smokers has also declined, from 20.6 cigarettes per day in 1985 to 16.4 per day in 2002, representing a reduction of 61 packages of cigarettes per smoker per year. In 2002, men smoked on average, 17.9 cigarettes per day compared with 14.8 cigarettes per day for women.

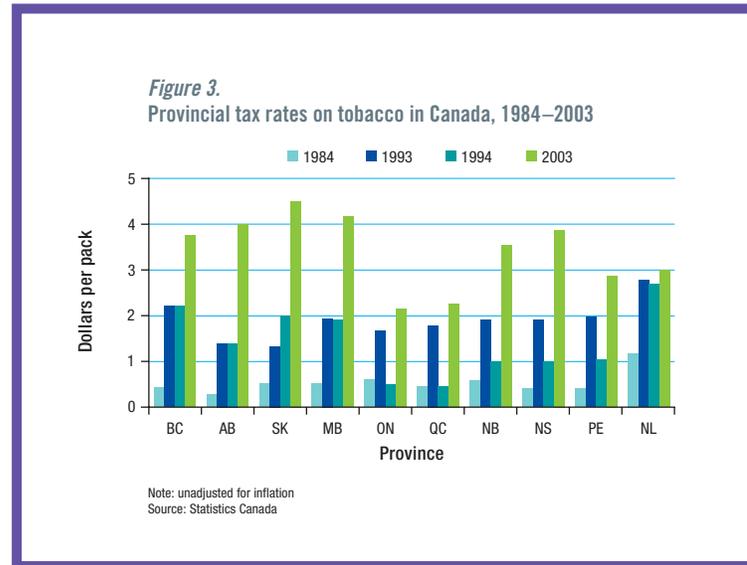
## **Tobacco control initiatives**

Tobacco control programs are designed to help current smokers quit and prevent young people from starting. In 1994, the federal government announced the \$185 million *Tobacco Demand Reduction Strategy* (TDRS). The TDRS encompasses three types of activities: legislation and enforcement; research; and, community initiatives and public information.

In September 1998, the Provincial/Territorial Conference of Ministers of Health asked the Provincial/Territorial Conference of Deputy Ministers of Health to develop a national tobacco strategy. The goals of the National Tobacco Control Strategy include prevention, cessation, protection and denormalization (the process of making smoking a socially unacceptable behaviour). In 2001, Health Canada launched the Federal Tobacco Control Strategy, which focuses on prevention, cessation, protection and harm reduction. Federal, provincial and local governments have implemented different but complementary strategies to pursue these goals. Efforts have included higher tobacco taxes, public education programs, warning labels, mass media campaigns, restriction of cigarette advertising and sales to minors, and restriction of smoking in the workplace and public areas.

### **Tobacco taxation and price levels**

Canadian tobacco products are taxed at both the federal and provincial levels. These combined taxes account for more than two-thirds of the cost of cigarettes purchased in Canada. There is evidence that price increases encourage some people to quit smoking and discourage others from starting. Tax increases from 1982 to 1992



resulted in steep increases in the real price of tobacco and a substantial decline in consumption. The smuggling of lower cost cigarettes from the U.S. and the resulting tax cuts in 1994 to curb this activity likely contributed to a rebounding of tobacco consumption among young Canadians in the early to mid 1990s. Provinces that cut their taxes in line with the federal government tax cuts showed the greatest increase in consumption in young people and, overall, had only a modest decline in per capita tobacco consumption compared with provinces that maintained provincial cigarette taxes. However, by 2003, provincial tobacco taxes had increased above pre-tax cut levels in all provinces, with the highest taxes in Western and Atlantic Canada (Figure 3).

# CANCER PREVENTION

## **Curbs on tobacco advertising**

Before 1988, there were no federal restrictions on tobacco advertising in Canada. Since then, there has been legislation limiting the type and nature of tobacco advertising. In 1997, Bill C-71, the *Tobacco Act*, further restricted tobacco advertising, introducing a total ban on sponsorship promotion, which came into force in October 2003.

In December 2002, the Quebec Superior Court upheld the constitutionality of federal tobacco advertising restrictions. To date, however, spending by the tobacco industry on promotion has not declined, as decreases in advertising have been matched by increases in sponsorships and retail promotion. Canada is one of the few developed countries that do not require health warnings on tobacco promotions.

## **Restricting retail promotion of tobacco**

There is also an increasing focus on restricting the retail promotion of tobacco. In March 2002, Saskatchewan's *Tobacco Control Act* prohibited the display of cigarettes in retail stores that are accessible to people under age 18. In response, Canada's second largest tobacco company (Rothmans, Benson & Hedges) argued in the Saskatchewan Court of Queen's Bench that the

law was in conflict with the federal *Tobacco Act*. The company's argument was unsuccessful; however, in October 2003, the Saskatchewan Court of Appeal declared Saskatchewan's *Tobacco Control Act* invalid. The Saskatchewan government is seeking to appeal to the Supreme Court of Canada. Legislation similar to that in Saskatchewan came into effect in Manitoba in January 2004, but is not being enforced, pending the outcome of the Saskatchewan appeal.

## **Restrictions on smoking in the workplace and in public areas**

An increasing number of jurisdictions are placing restrictions on cigarette smoking in public places. According to a 2001 Health Canada survey of tobacco control bylaws, at least 63% of Canadians lived in jurisdictions that restricted smoking. Among these jurisdictions, at least 30% of the bylaws were enacted in the five years before the survey.

Although most restrictions have been at the local level, there is an increasing trend for tobacco control restrictions to move to higher tiers of government (from municipal to regional to provincial levels). In 2002, Newfoundland and Labrador became the first Canadian province to ban smoking in restaurants and places where those

under age 19 years are allowed. In the same year, an amended Occupational Health and Safety Regulation came into effect in British Columbia, which severely restricts smoking in restaurants, bars and casinos. As of January 2003, the *Nova Scotia Smoke-Free Places Act* prohibited smoking in restaurants except in designated smoking rooms.

### **Nicotine replacement therapies and other cessation interventions**

Smoking cessation can be aided by the use of nicotine replacement therapies. The nicotine patch and nicotine gum are now sold without prescription in Canada. Bupropion (Zyban) is a prescription antidepressant that has been found to help people with nicotine withdrawal. It may be used in combination with either the nicotine patch or gum.

Annual sales of these nicotine replacement therapies have increased in recent years, suggesting that more Canadians are quitting smoking or attempting to quit. In 1994, pharmacies sold approximately \$20.8 million in nicotine patches. By 1998, nicotine patch sales had increased by 42%, to \$29.5 million. A similar trend was observed for sales of nicotine gum, sales of which increased by 45%, from \$10.4 million to \$15.1 million during the same period.

*Figure 4.*  
Example of a warning label currently found on cigarette packages in Canada



### **Public education — warning labels**

Federal law first made health warnings on cigarette packaging mandatory in 1989. In 1994, these warnings were made more prominent, occupying the top 35% of the main display surface of the box. In 2000, the warnings were modified to include graphic images of the health consequences of smoking and were required to cover half of the cigarette package. Some of these images include a damaged heart, a brain after a stroke and the role that smoking plays in impotence (Figure 4). In addition, further detailed health information has been added to the inside of the package. A study funded by the Institute of Cancer Research of the Canadian Institutes for Health Research noted that almost half of smokers surveyed said that the warnings increased their motivation to quit and raised awareness of the effect of smoking on their health. In December 2002, the Superior Court in Quebec upheld the constitutionality of these picture-based package warnings.

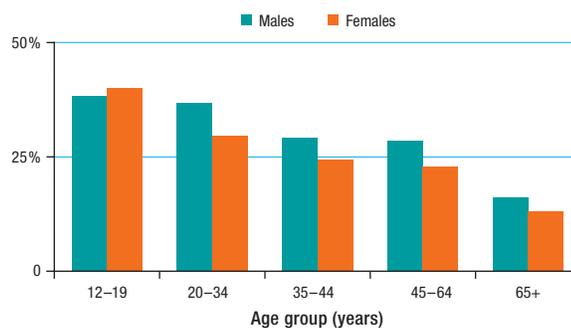
## International efforts

The World Health Organization-sponsored Framework Convention on Tobacco Control (FCTC) is the first proposed international public health treaty. The objective of the FCTC is to reduce the health consequences of tobacco use through collective international action and cooperation on tobacco control. Formal negotiations began in 2000, and a final framework was accepted in May 2003. Canada signed the Framework convention on July 15, 2003. The FCTC contains a comprehensive ban on tobacco advertising, promotion and sponsorship, with exemptions for those countries having constitutional limitations.

## Environmental Tobacco Smoke

Environmental Tobacco Smoke (ETS) or second-hand (passive) smoke is carcinogenic to humans. Second-hand smoke exposes non-smoking individuals to the same carcinogens and toxic substances as smokers, though in different doses. Indeed, some toxic chemicals are at higher concentration in sidestream smoke (the smoke released by the tip of a burning cigarette) than in the smoke inhaled by smokers. After a careful review of the evidence on associations between ETS and lung cancer, a working group of the International Agency for Research on

**Figure 5.**  
Percentage of Canadian non-smokers aged 12 years and over exposed to second-hand smoke, by age group, 2000–2001



Source: Statistics Canada, Canadian Community Health Survey

Cancer, a specialized agency of the World Health Organization, concluded that second-hand smoke is a cause of lung cancer among those who have never smoked. It also noted that non-smokers who are exposed to second-hand smoke have a 20% to 30% greater risk of lung cancer than people not exposed to second-hand smoke.

## Canadian statistics on second-hand smoke

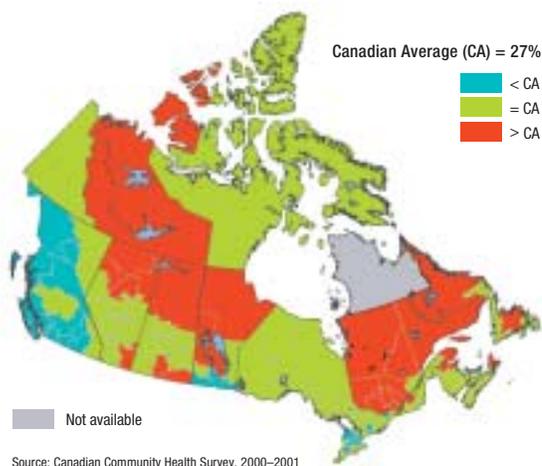
According to the 2000–2001 Canadian Community Health Survey (CCHS), 28% of Canadians are exposed to second-hand smoke. Exposure varied by age and sex. The highest exposure occurred among individuals aged 12 to 19 (Figure 5). Except for the youngest age

group, males reported higher rates of exposure than females. Exposure to second-hand smoke also varied across the country. The highest rates of exposure to second-hand smoke were reported in the N.W.T. (46%) and the lowest rates in British Columbia (18%) (Figure 6). Labelling on Canadian cigarette packages includes warnings of the dangers of exposure to second-hand smoke (Figure 7).

## Diet

Current evidence suggests that diet-related factors account for about 30% of all cancers in developed countries. Studies have examined

**Figure 6.**  
Proportion of non-smokers aged 12 years and over exposed to second-hand smoke, 2000–2001



**Figure 7.**  
Example of a warning label currently found on cigarette packages in Canada concerning second-hand smoke



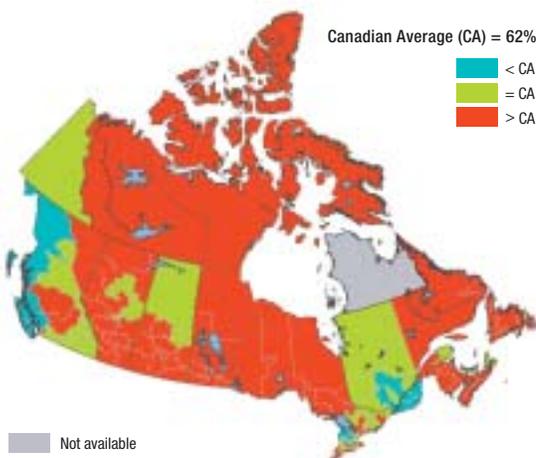
the association between diet and cancer by the types of food consumed (e.g. meat, fruits and vegetables) and by food constituents (e.g. specific vitamins, fibre, fat). Evidence indicates that a diet high in fruits and vegetables reduces the risk of several types of cancer, particularly cancers of the gastrointestinal tract (mouth, pharynx, esophagus, stomach, colon and rectum).

The effect of specific food constituents such as fibre and anti-oxidant vitamins (or their precursors, such as beta-carotene) on cancer risk is still unclear. Meat consumption has been linked to higher rates of colon and some other cancers. Other factors, such as obesity, physical inactivity, and low fruit and vegetable consumption, also play a role.

## The role of fat intake

There has been much debate on the role of fat intake in cancer risk. A recent review concludes that other dietary measures, such as increasing consumption of fruits, vegetables and whole grains and decreasing consumption of red meat, may be more effective in decreasing the risk of breast, colorectal and possibly prostate cancer than decreasing total fat intake. The types of fat consumed may also be important. The changes in the fat consumption of beef in Canada in the 1980s, along with the downgrading of marbled beef as the highest quality, contributed to a reduction in saturated fat consumption in Canada

**Figure 8.**  
Proportion of the population aged 12 years and over who eat fruits and vegetables at least five times daily, 2000–2001



Source: Canadian Community Health Survey, 2000–2001

and may have contributed to declines in colorectal cancer that have occurred since then.

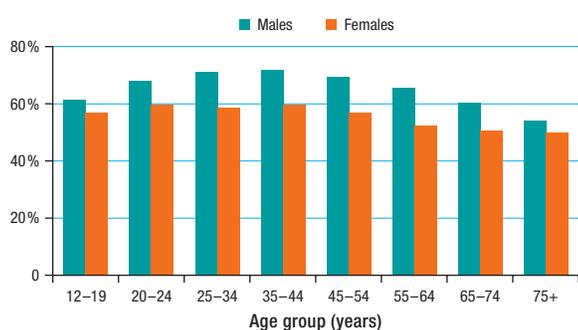
## Fruit and vegetable consumption

Internationally, populations are consistently advised to consume a varied diet with ample fruits, vegetables and whole grains in an effort to reduce cancer risks. The *Canadian Food Guide* currently recommends 5 to 10 servings of fruits and vegetables daily. According to the 2000–2001 CCHS, more than 60% of Canadians consume less than the recommended daily amount. Fruit and vegetable consumption varied across the country, with the lowest consumption in the North West Territories (72% consumed less than recommended) and the highest in Quebec (although 55%, or the majority of the population, still consumes less than recommended) (Figure 8).

Fruit and vegetable consumption also varies with sex and age (Figure 9). Across all age groups, men consistently eat fewer servings of fruits and vegetables per day than women. While the majority of Canadians aged 20 to 54 ate less than the recommended daily amount, consumption of fruits and vegetables increased gradually among men and women over the age of 55.

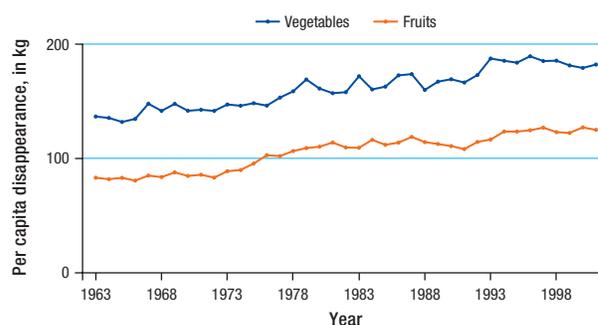
The 1998–1999 NPHS showed differences in the diet preferences among men and women. When making food choices, women were more

**Figure 9.**  
Percentage of Canadians aged 12 years and over who consume less than the recommended amount of fruits and vegetables, by gender and age, 2000–2001



Source: Canadian Community Health Survey, Statistics Canada

**Figure 10.**  
Per capita estimation of fruits and vegetables in Canada, 1963–2001



Source: Statistics Canada, 2002

likely to consider overall health, weight and specific diseases. Eighty percent of women were concerned about maintaining or improving health through food choice, compared with 63% of men. While 59% of women considered their weight when selecting foods, just 41% of men did so.

Consumption of fruits and vegetables was also higher among people in the middle to upper income categories and among those with post-secondary education. Eating fruits and vegetables was also associated with other health-promoting behaviours, including physical activity and not smoking.

Since the early 1960s, consumption of fruits and vegetables in Canada has steadily increased.

Statistics Canada, which estimates the amount of food available per capita for human consumption, has estimated that Canadians ate, on average, 137 kg of fruits and 84 kg of vegetables annually in 1963. By 2001, these numbers had increased by almost 40% to 183 kg of fruits and 125 kg of vegetables (Figure 10). These changes in diet have probably contributed to the reduction in risk of some cancers. The best evidence for this is the decline in the last decade of cancers of the gastrointestinal tract, such as colorectal cancer (Figures 3, 4, 7, 8 in the Introduction). Larger declines in colorectal cancer among women may also reflect their increasing use of hormone replacement therapy.

# CANCER PREVENTION

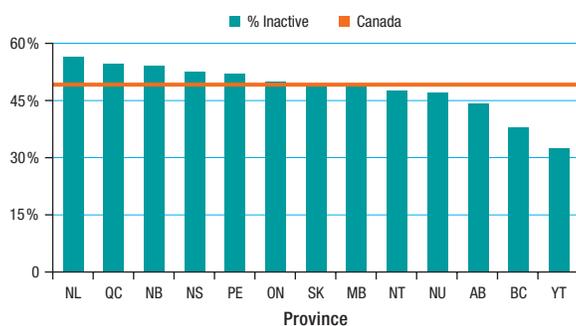
## Physical activity

### The benefits of exercise

Physical activity reduces the risk of colon and breast cancer and possibly of cancer of the endometrium (uterus) and prostate. Studies have demonstrated a 40% reduced risk of colon cancer with high levels of physical activity and a 30% to 40% reduced risk of breast cancer among the most physically active women. A 20% to 40% reduction in the risk of uterine cancer has been noted in some studies of physically active women, and a 10% to 30% reduction in the risk of prostate cancer has been noted in some studies of physically active men.



**Figure 11.**  
Percentage of Canadians aged 12 years and over who are physically inactive, by province, 2000–2001



Source: Statistics Canada, Canadian Community Health Survey

### Rates of physical inactivity

According to the 2000–2001 CCHS, over half of all Canadians aged 12 years or older are considered physically inactive. The highest levels of physical inactivity were reported in the Atlantic Provinces and Quebec (Figure 11). Women have consistently been classified as more physically inactive (54%) than men (44%), but inactivity rates have been gradually declining in both sexes since 1994 (Figure 12). Levels of physical inactivity increase with increasing age (Figure 13). The most active members of the Canadian

population surveyed in the CCHS are children aged 12 to 14 years: only 20% reported being inactive. As with adults, boys are more active than girls. By the age of 25, 50% of Canadians were classified as physically inactive.

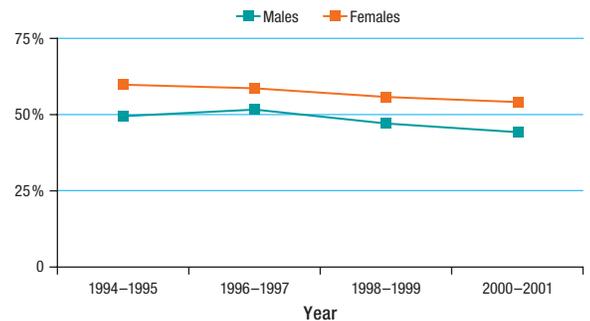
**Factors influencing physical activity**

Findings from the NPHS indicate that Canadians’ involvement in physical activity is influenced by a complex range of environmental, social and psychological factors, including socio-economic status, level of education and family responsibilities. Research has revealed that workplace, community and mass-media physical activity programs have only modest success, and the effects are rarely long term. In spite of the introduction of nationwide fitness programs designed to promote physical activity, a majority of Canadians remain inactive.

**Obesity**

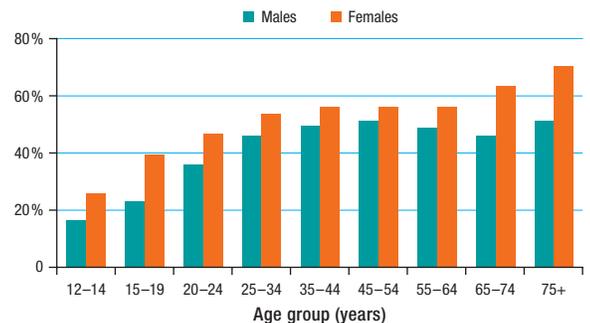
The International Agency for Research on Cancer estimates that being overweight or obese accounts for over 25% of colon, endometrial, kidney, esophageal and postmenopausal breast cancer cases worldwide. One way to determine whether an individual is overweight is to calculate his or her Body Mass Index (BMI): weight in kilogram divided by height in metres squared. According to international standards, adults with

**Figure 12.**  
Percentage of Canadians aged 12 years and over who are physically inactive, by gender, 1994–1995 to 2000–2001



Source: National Population Health Survey, Canadian Community Health Survey, Statistics Canada

**Figure 13.**  
Percentage of Canadians aged 12 years and over who are physically inactive, by gender and age, 2000–2001

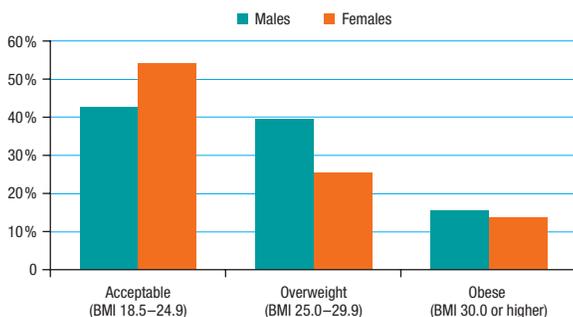


Source: Statistics Canada, Canadian Community Health Survey

BMI's ranging from 25.0 to 29.9 are considered overweight and those with BMI's at 30.0 or higher are obese. It is, however, possible to be too thin for full health. The standard for an acceptable weight is a BMI of 18.5–24.9.

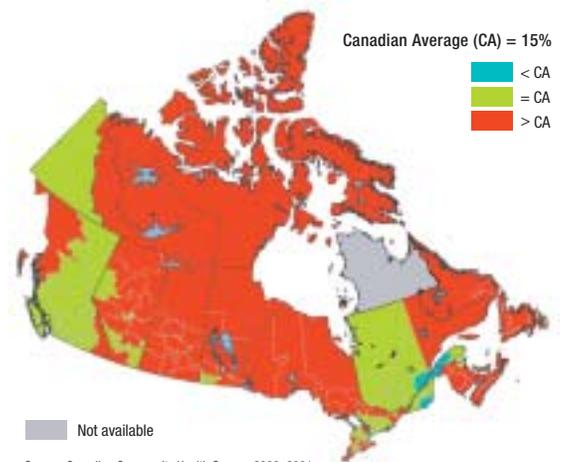
High BMIs are associated with an increased risk of colon cancer. Several studies have reported that colon cancer risk for obese individuals is nearly double that of individuals of normal weight. Heavier women are also at increased risk of endometrial cancer and breast cancer in their postmenopausal years. There is an association between renal cell cancer and obesity: obese individuals have twice the risk of developing this form of kidney cancer compared to those at an acceptable weight. An increased risk of esophageal adenocarcinoma has also been linked with obesity. The incidence of this type of cancer has increased by more than 350% since the mid-1970s, an increase that has been attributed to obesity and the associated gastro-esophageal reflux (heartburn).

**Figure 14.**  
Percentage of Canadians aged 20–64 years that are at an acceptable weight, overweight or obese, by gender, 2000–2001



Source: Canadian Community Health Survey 2000–2001

**Figure 15.**  
Proportion of the population aged 20–64 years classified as obese (BMI 30+), 2000–2001

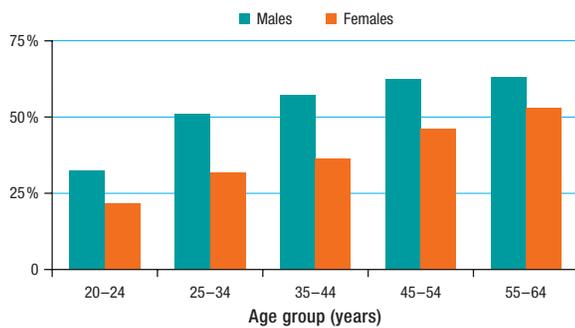


Source: Canadian Community Health Survey, 2000–2001

## Obesity among Canadians

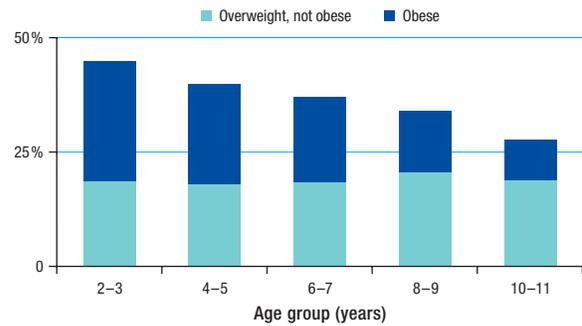
Estimates from the CCHS show that almost 50% of Canadians are at an unhealthy weight. In the 2000–2001 survey, 47.5% of Canadians were considered to be overweight and, of these, almost a third, or 15% of the total population, were obese. More men (56%) than women (39%) were overweight (Figure 14). Data from the CCHS also indicate that there are currently 2.8 million obese Canadians aged 20 to 64, an estimated increase of 532,000 since 1994 (Figure 15). The highest percentage of overweight Canadians live in the Atlantic Provinces, where 55% to 60% of individuals aged 20 to 64 are overweight or obese. Populations in the North West Territories

**Figure 16.**  
Percentage of Canadians aged 20–64 years that are overweight (BMI 25–29.9) or obese ( $\geq 30$ ), by age group and gender, 2000–2001



Source: Statistics Canada, Canadian Community Health Survey

**Figure 17.**  
Percentage of Canadian children overweight or obese, by age group, 1998–1999



Source: National Longitudinal Survey of Children and Youth

and Nunavut are also among the heaviest in the country. The lowest percentages of overweight or obese Canadians are found in British Columbia (42%) and Quebec (44%). Further, there is an increase in the percentage of overweight or obese Canadians with increasing age (Figure 16). There are more overweight or obese males than females for all age groups. The greatest prevalence of obesity, however, is among those aged 45 to 54; 25% of all obese Canadians fall into this age group.

### Obesity among Canadian children

Obesity rates are also increasing among Canadian children. According to the National Longitudinal

Survey of Children and Youth, 37% of Canadian children aged 2 to 11 were considered overweight in 1998–1999, and 18% were obese. This represents a considerable increase since 1981, when 18% of children were overweight and only 5% were obese. Younger children (age 2 to 5) were more likely to be obese than older children (age 8 to 11) (Figure 17). While overweight children had activity levels similar to children with normal weights, the activity levels of obese children were considerably lower. Research also indicates that higher proportions of obese children live in low-income families.

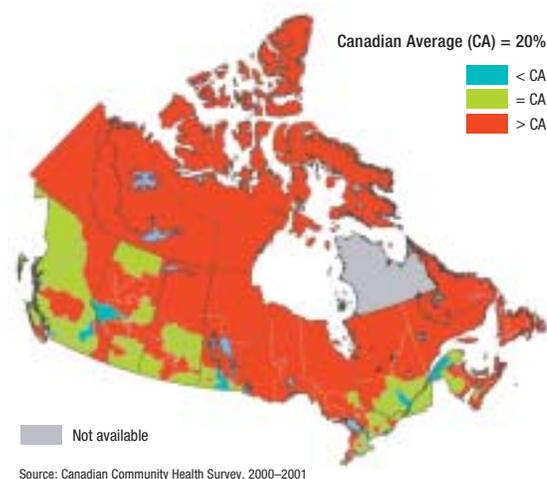
# CANCER PREVENTION

## Alcohol consumption

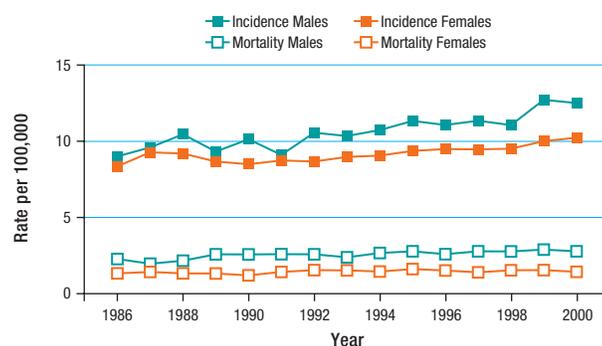
Alcohol consumption increases the risk of many types of cancer. Consuming 25 grams of alcohol per day, the equivalent of two standard drinks, increases the risk of mouth, pharynx, larynx and esophageal cancers, predominantly in those who also smoke heavily. Heavy alcohol consumption causes cirrhosis of the liver and, consequently, an increased risk of liver cancer. There is also evidence linking alcohol consumption to breast cancer in women and colorectal cancer, especially in men. There is also some evidence linking alcohol consumption to stomach cancer. In all these cancers, the risk increases with the amount of alcohol consumed.

Information on alcohol consumption among Canadians was collected during the CCHS (2000–2001) and the NPHS (1994–1995 to 1998–1999). Results from these surveys indicate that men consume more alcohol than women at all ages, and that the highest levels of consumption occurred among males aged 20 to 24 years and 65 to 74 years, and women aged 65 to 74 years (data not shown). The survey assessed the frequency of heavy drinking among current drinkers. Heavy drinking was defined as five or more drinks consumed on one occasion,

**Figure 18.**  
Proportion of drinkers aged 12 years and over who drink heavily at least 12 times a year, 2000–2001



**Figure 19.**  
Age-standardized incidence and mortality rates of malignant melanoma, by gender, 1986–2000



12 or more times per year. The prevalence of excessive alcohol intake varied across Canada. In 2000–2001, the frequency of heavy drinking was highest in the three Territories, Newfoundland and Nova Scotia, and the lowest levels were found in Ontario, British Columbia and Quebec (Figure 18).

### *Sun exposure*

Skin cancer is the most common form of cancer in Canada. The majority of skin cancer cases are the non-lethal forms: basal cell cancer and squamous cell cancer. The least common and most serious form of skin cancer is melanoma. The incidence of melanoma is on the increase among both men and women (Figure 19). In 2000, there were 3,752 new cases and 709 deaths due to melanoma in Canada.

The primary factor that increases the risk of all skin cancers is excessive exposure to ultraviolet (UV) radiation. The most common source of UV radiation is the sun, although artificial sources such as tanning lamps and beds also produce UV radiation. A recent study concluded that these tanning devices also increase the incidence of non-melanoma skin cancer.

Individuals at particular risk of skin cancer are those with fair to light skin colour, a family history of skin cancer and a history of sunburns. Research suggests that there may be a link between childhood sunburn(s) and melanoma in adulthood. According to the 1996 National Sun Exposure Survey, 50% of adults reported being sunburned at least once during the summer months. Also, parents reported that 50% of children aged 12 or less spent more than two hours in the sun each day during the summer months and that at least 45% of children had been sunburned during that time.

The 1996 National Sun Exposure Survey examined the *sun exposure* of Canadians at leisure from June to August. It reported that 32% of the individuals surveyed reported staying in the sun for one to two hours, and 28% reported exposures of two hours or more. The remaining 40% reported exposure to the sun for less than one hour.

In this survey, information was also collected on the *sun protection* habits of Canadians at leisure. In most cases, women were more likely than men to adopt sun safety measures (Figure 20). The prevalence of most sun protection behaviours

# CANCER PREVENTION

increased with age. Individuals aged 15 to 24 spent the most time in the sun and rarely used sun protection practices. The only exception with the age association was sunscreen use. Individuals over the age of 65 reported rarely using sunscreen on their face (60%) or their body (71%).

## Preventing skin cancer

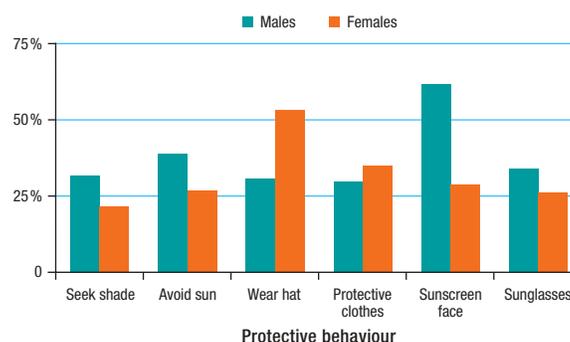
Skin cancer is a largely preventable disease when sun protective practices are used. The Canadian Dermatology Association and the Canadian Cancer Society recommend six actions for sun safety: avoid the sun between 11 a.m. and 4 p.m., seek shade, wear a hat, wear sun protection clothes, use sunscreen and wear sunglasses.

However, sunscreens should not be used to prolong sun exposure. It is important to educate all people, especially the young, about the risk of prolonged sun exposure and encourage them to develop healthy sun behaviours, concentrating on sun avoidance and wearing of sun-protection clothes. It is also important to recognize the need to provide shade in school playgrounds and other recreational areas.

## Making progress in prevention

Impacts from positive changes in some modifiable risk factors (e.g. smoking and diet) are already being seen in Canada, especially in relation to

**Figure 20.**  
Percentage of Canadians aged 15 years and over who rarely or never adopt sun protection behaviours, by gender



Source: The National Sun Exposure Survey, UBC, 1998

reduction of lung cancer in men and reduction of colorectal cancer in both men and women.

Current efforts to encourage further healthy changes in diet and physical activity include:

- the development of a national chronic disease primary prevention plan by the Chronic Disease Prevention Alliance of Canada;
- the planned implementation by the Canadian Strategy for Cancer Control of a primary prevention system at the national, provincial/territorial and community levels to address population-based risk factors for cancer; and
- the development by the Healthy Living Strategy of comprehensive strategies to encourage healthy eating, physical activity and healthy weights.

## The Healthy Living Strategy

The Healthy Living Strategy is a Pan-Canadian effort by the Federal, Provincial and Territorial departments of Health to positively influence the diet and physical activity levels of Canadians. Strategic directions include leadership and public policy development, knowledge development and transfer, community development and infrastructure, and public information.

One advantage of the Healthy Living Strategy compared with previous efforts to influence diet and physical activity is its comprehensive approach. This approach reflects an increasing recognition that a multisectoral “preventive dose” of policy and program activity is necessary to achieve a meaningful impact on the prevalence of risk factors for cancer and other chronic diseases, and on the disease patterns associated with them.

## Future challenges

### Drawing on lessons learned

The successes achieved in tobacco control have come only after almost four decades of public health interventions involving a wide variety of

public health activities, such as social marketing (health promotion), taxation and regulations restricting tobacco use and how it is marketed, together with the expenditure of hundreds of millions of dollars. The current epidemic of obesity resulting from poor diets and physical inactivity has been decades in the making. Efforts to control this epidemic will need to draw upon the lessons learned from tobacco control and will need to be equally comprehensive.

At a recent national symposium on cancer prevention sponsored by the Canadian Strategy on Cancer Control, the following prevention challenges were raised:

- ensuring that surveillance organizations give proper attention to risk factor surveillance and that research-granting agencies give appropriate attention to prevention research;
- facilitating the progress of practices that require infrastructure and capacity building support in communities across Canada;
- promoting prevention through public and media advocacy; and
- linking communities with prevention practices.

# CANCER PREVENTION

A key message of the Canadian Strategy on Cancer Control is that preventive action now, based on sound research and clinical observation, will help reduce the incidence of cancer among Canadians in coming years. The Strategy also recognizes that effective prevention measures will require Canadians to embrace disease prevention and health promotion as a societal value.

## Smoking cessation

- It is essential that major efforts continue to be made to persuade smokers to quit while they are young, since the longer a person smokes the greater the risk of lung and other cancers.
- In Canada, the majority of cases of lung cancer in males are now occurring in former smokers and not current smokers. Smoking cessation should continue to be promoted at all ages, as, even at older ages, cessation prevents further increases in risk of cancer and may have a more immediate impact on lowering the risk of other chronic diseases (especially heart disease).

## Attention to diet

While fruit and vegetable consumption has been increasing, more emphasis needs to be placed on consumption of whole fruits and vegetables (rather than juices or dietary supplements) and increasing daily consumption to recommended levels of 5 to 10 servings per day.

## Addressing obesity

Excessive body weight among children is associated with increased risk of being overweight as an adult, suggesting that obesity will continue to be an important health issue in Canada over the next several decades.

Given the strong links between obesity and increased cancer risk (and other chronic diseases), health policy initiatives aimed at cancer prevention must include changes in the physical and social environment that will support, promote and reinforce changes in behaviour that lead to healthier lifestyle choices.

# CANCER SCREENING

Screening attempts to identify cancer or its precursors early in the disease process, before symptoms appear. The goal of cancer screening is to reduce morbidity from the disease and increase the likelihood of survival through early treatment. However, screening will only be beneficial if early treatment options offer some advantage over later treatments. Although it seems obvious that survival chances are improved when cancer is detected earlier, this is not always the case.

## Screening practices

Screening is offered to apparently healthy people through organized programs or on an opportunistic basis. Opportunistic screening occurs either when a physician or other care provider advises the patient to be screened or when the patient requests it. Organized screening programs are typically characterized by:

- the ability to identify individuals in the target population;
- measures to promote high coverage and attendance;
- adequate field and laboratory facilities;
- organized quality control;
- adequate facilities for diagnosis and appropriate treatment of confirmed cancer;



- a carefully designed and agreed upon referral system; and
- evaluation and monitoring of the program.

The benefits of organized screening programs include: the ability to recruit individuals in target groups, including the hard to reach; promotion of increased attendance for investigation or re-screening; decreased health care system costs; and the adoption of routine and ongoing quality assurance, evaluation and overall program monitoring.

In Canada, there are significant levels of cancer screening for four major cancers: breast, cervical, prostate and colorectal. Although there is interest

# CANCER SCREENING

in screening for other cancers (e.g. lung, liver, testicular, ovarian), to date there is little evidence of either a health benefit or of widespread adoption.

Provincial and territorial governments not only pay for most cancer screening tests performed in Canada but also promote (or discourage) the use of various screening modalities. The federal role has been to help support the development of screening policies and guidelines. This section describes current screening guidelines and programs in Canada for breast, cervical, colorectal and prostate cancer, and briefly discusses the emerging technologies of genetic testing.

## *Breast cancer*

### CANADIAN TASK FORCE ON PREVENTIVE HEALTH CARE GUIDELINES

*There is good evidence for screening women aged 50–69 by clinical examination (CBE) and mammography. The best available data support screening every 1–2 years (1998) Current evidence does not support the recommendation that screening mammography be included in or excluded from the periodic health examination of women aged 40–49 at average risk of breast cancer (2001). Because there is fair evidence of no benefit, and good evidence of harm, there is fair evidence to recommend that routine teaching of breast self-examination be excluded from the periodic health examination of women aged 40–69 (2001).*



Breast cancer is the most common cancer among Canadian women and is second only to lung cancer as the leading cause of cancer-related deaths in Canadian women. In 2000, 18,523 women were diagnosed with breast cancer, and 4,857 women died from it.

Nearly one-half of all new breast cancer cases occur among women between the ages of 50 and 69 years. Women in this age category are believed to benefit the most from breast cancer screening by mammography.

A screening mammogram is an x-ray of the breast in a woman who shows no signs of breast cancer. It usually involves two views (films) of each breast. Mammograms can detect breast cancers at an early stage, often before tumours can be felt or have spread to the lymph glands. Mammograms will also detect more advanced breast cancers, as will clinical breast examinations performed by a carefully trained health professional. In trials of regular screening mammography among women aged 50 to 69 years, the chance of dying of breast cancer was reduced, on average, by 30%. However, to achieve this benefit, the quality of mammography must be high, and the procedure should preferably be offered through

# CANCER SCREENING

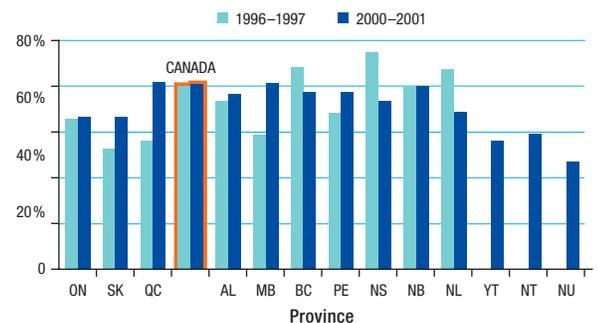
organized programs. Further, the population mortality benefits of mammography noted in the clinical trials were not apparent until 7 to 10 years after screening had begun.

In Canada, breast screening by mammography may be accessed either through an organized provincial/territorial program or through the fee-for-service sector. The majority of screening mammography is conducted in Canada within organized screening programs. Data on breast cancer screening can be obtained either from the organized screening programs or from surveys. Although self-reported data, in theory, include the results of all screening mammograms wherever they occur, survey data are known to overestimate the prevalence of mammography. Unfortunately, administrative data from the fee-for-service sector often do not differentiate between diagnostic and screening mammography, and do not capture screening mammography provided through global hospital budgets, limiting the usefulness of the data for monitoring screening.

The proportion of Canadian women aged 50 to 69 years who have undergone mammography has been estimated from cross-sectional data collected from the 1996–1997 National Population Health Survey (NPHS) and the 2000–2001 Canadian Community Health Survey (CCHS).

Approximately half of Canadian women in this age group reported having had screening mammography in the previous two years in both the 1996–1997 and the 2000–2001 surveys. In the 1996–1997 survey, 43% of women in Saskatchewan reported having had screening mammography compared to 76% of women in Nova Scotia (Figure 1). This disparity was less in the 2000–2001 survey, with increases in the reported proportion of women having a recent screening mammogram in all but three provinces (British Columbia, Nova Scotia and Newfoundland and Labrador). In 2000–2001, the lowest mammography screening rate in the country was in Nunavut, where only 38% of women reported screening mammography in the previous two years.

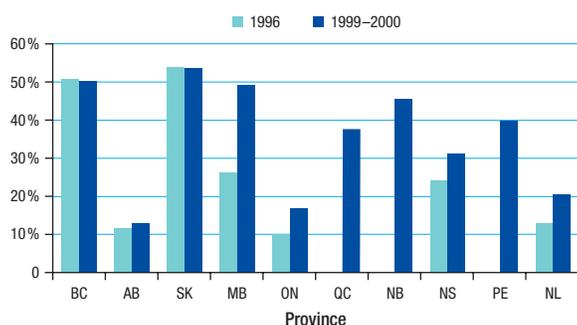
**Figure 1.**  
Percentage of women aged 50–69 years reporting that they had received a screening mammogram within the last 2 years, by province



Source: 1996–1997 National Population Health and 2000–2001 Canadian Community Health Surveys

# CANCER SCREENING

**Figure 2.**  
Percentage of women aged 50–69 years who participated in provincial breast cancer screening programs in 1996 and 1999–2000, by province



Source: Organized Breast Cancer Screening Programs in Canada, 1996, 1999 and 2000 Reports

## Organized screening programs

The number of provinces with organized screening programs increased from seven in 1996 to all ten in 2000. In 1999–2000, women aged 50–69 from British Columbia, Saskatchewan and Manitoba achieved 50% participation with biennial mammography screening. Other provincial programs had much lower participation (Figure 2). These participation rates for screening are well below the national target of at least 70% participation among women aged 50 to 69, set to achieve the expected impact on breast cancer mortality.

## Groups at high risk of not having mammography

Women who are less likely to report mammography in the CCHS include those of lower educational levels, of single marital status, as well as those who are unemployed and those with a place of birth outside North America, Europe or Australia.

## Clinical breast examinations and self-examinations

Clinical breast examinations (CBEs) can identify a small number of cancers that would not be detected by mammography. Data on self-reported CBEs are available for three provinces (Newfoundland and Labrador, New Brunswick, and Ontario) from the 2000–2001 CCHS. Although roughly one-half of all women aged 18 years and older reported having had a CBE within the previous 12 months, more than one in five reported that they had never had one. Although most CBEs are conducted on an opportunistic basis, organized programs in five provinces (Manitoba, Ontario, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador) offer CBE in addition to mammography.

The Canadian Task Force on Preventive Health Care Guidelines recommend against the teaching of breast self-examination (BSE) as part of the periodic health examination. However, many provinces and territories continue to promote its use. The Canadian Cancer Society encourages women to perform BSE to help them learn what is normal for their breasts so that they will be able to notice any changes.

## *Cervical cancer*

### CANADIAN TASK FORCE ON PREVENTIVE HEALTH CARE GUIDELINES

*Annual screening is recommended following initiation of sexual activity or at age 18; after two normal smears, screen every three years to age 69. Consider increasing frequency for women with risk factors: age of first sexual intercourse < 18 years, many sexual partners or having a consort with many partners, smoking or low socioeconomic status. There is fair evidence to include the Pap smear in the periodic health examination of sexually active women. (1994)*

Cervical cancer is the 12th most commonly diagnosed cancer among women in Canada. In 2000, there were 1,358 newly diagnosed cases and 398 deaths attributable to cervical cancer. While cervical cancer is relatively uncommon in

Canada, it is the third most common cancer in women worldwide, and is the second leading cause of cancer deaths among women in developing countries.

Progression of the precursors of invasive cervical cancer is largely preventable if they are detected by effective screening and then treated. The Papanicolaou (Pap) smear test involves collecting cells from the surface of the cervix of asymptomatic women, which are then deposited on a slide, stained and examined for abnormalities. If the presence of pre-cancerous changes is confirmed, the cervix is then examined for abnormalities by a physician trained in colposcopy, so that treatment designed to prevent invasive cervical cancer can be provided. Increasingly, screening programs are investigating or moving to liquid-based cytology collection systems, neural-net screening and re-screening tools, and computer algorithms for selecting slides for screening or re-screening.

International studies have shown that in a well-conducted program, with expert cytology and high compliance from women offered screening, the risk of invasive cervical cancer developing in screened women can be reduced by more

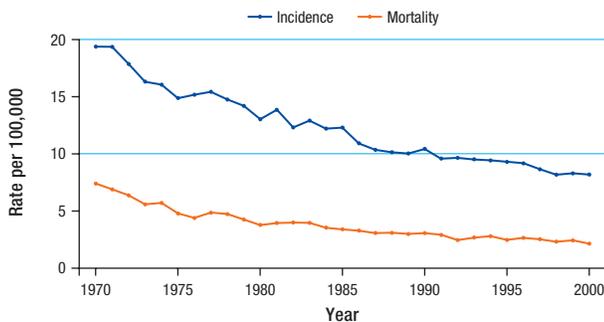
# CANCER SCREENING

than 90%. In Canada, the reduction in age-standardized death rates from cervical cancer, from 7.3 per 100,000 women in 1969 to 2.2 per 100,000 in 2000 (Figure 3), is believed to be largely the result of cervical cancer screening.

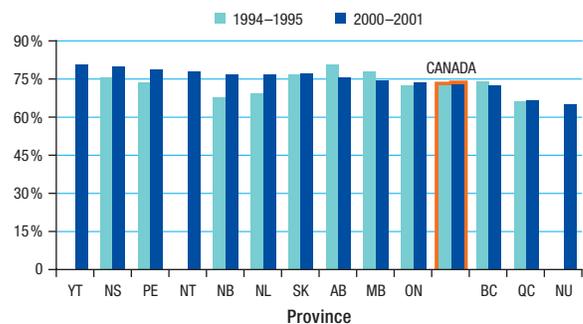
The proportion of Canadian women who report having had a Pap smear test within the previous three years has been estimated from data collected from the NPHS and the CCHS. Data from the 1994–1995 NPHS and 2000–2001 CCHS suggest little change over time (Figure 4), reflecting the high proportion of women who reported having had a recent Pap smear test (73%) in both surveys. The proportion of women screened ranged from a low of 66% in Quebec

in 1994–1995 and Nunavut in 2000–2001 to a high of over 80% in Alberta in 1994–1995 and Nova Scotia and Yukon in 2000–2001. The percentage of women tested varied by age, the lowest rates being observed for the youngest (20–24 years) and oldest (65–69 years) age groups (Figure 5). In both surveys, less than one-half of women aged 18 to 19 years of age (data not shown) reported ever having had a Pap smear test; the prevalence of testing increased with successive age groups and peaked among women aged 25 to 34. After this, there was a gradual decline in the proportion of women being tested.

**Figure 3.**  
Age-standardized incidence and mortality rates for cervical cancer, Canada, 1970–2000

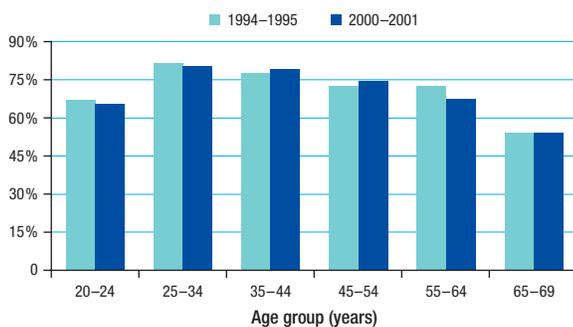


**Figure 4.**  
Percentage of women aged 18–69 years reporting a Pap smear test within the last 3 years, by province



Source: National Population Health Survey, 1994–1995 and Canadian Community Health Survey 2000–2001

**Figure 5.**  
Percentage of women having a Pap smear test in the past 3 years, by age, Canada



Source: National Population Health Survey, 1994-1995 and the Canadian Community Health Survey 2000-2001

### Organized screening programs

Eight provinces have screening programs for cervical cancer (all but Quebec and New Brunswick). These programs vary considerably in scope. Only Saskatchewan issues initial personal invitations for screening. British Columbia uses a single, centralized laboratory service; the Ontario program does not even receive laboratory results. Most programs do not have a system in place to recall women for routine re-screening.

### High-risk populations

Women of low socio-economic status, Aboriginal women and women born outside of North America, Europe or Australia were less likely to report in the CCHS that they were recently screened for cervical cancer.

### Colorectal cancer

#### CANADIAN TASK FORCE ON PREVENTIVE HEALTH CARE GUIDELINES

*Canadian Task Force on Preventive Health Care Guidelines: There is good evidence to include annual or biennial fecal occult blood testing (FOBT) and fair evidence to include flexible sigmoidoscopy in the periodic health examination of asymptomatic people over 50 years of age. There is insufficient evidence to make recommendations about whether only one or both tests should be performed. There is insufficient evidence to include or exclude colonoscopy as an initial screening test in the periodic health examination of people in this age group (2001).*

Colorectal cancer (CRC) is the third most common cancer in Canada, after breast and lung cancer in women and prostate and lung cancer in men. In 2000, there were 18,397 newly diagnosed cancer cases and 7,927 deaths attributable to CRC.

CRC is believed to develop from a benign tumour or polyp found in the bowel, though some of these may be “flat adenomas” and therefore difficult to detect. These polyps develop over a period of time (at least 10 years)

## CANCER SCREENING

on the bowel wall and later invade the wall and other organs. Approximately two-thirds of these cancers are found in the large intestine and one-third in the rectum.

Screening for CRC may be done through a fecal occult blood test (FOBT). As bowel cancers can bleed, the FOBT is used to detect small amounts of blood in the stool. This can lead to a diagnosis of the disease at an earlier stage, when it can be treated more effectively, therefore reducing mortality. Studies show that regular FOBT testing may lower the mortality rate of CRC by about 20%. The FOBT could also lead to detection of some pre-cancerous polyps, as polyps can also bleed.

There are no organized population-based screening programs for CRC in Canada; screening is currently done on an ad-hoc basis. Thus the potential effect of screening on reducing CRC mortality in Canada is not known. While there has been a decline in CRC mortality, it seems unlikely that much, if any, is due to screening.

Both the Canadian Cancer Society and the National Committee on Colorectal Cancer Screening (NCCCS) support an organized approach to CRC screening to ensure that indi-

viduals 50 years of age and over have a FOBT at least every two years. They suggest that programs include follow-up for positive tests with appropriate definitive tests — colonoscopy, double contrast barium enema or sigmoidoscopy. The cost-effectiveness of CRC screening is comparable to that of screening mammography. However, no organized program with compliance at the effective level has yet been achieved anywhere in the world because of relatively poor acceptance of the FOBT. In Ontario, a screening program was proposed for everyone in the province over the age of 50 but has not yet been initiated because of concerns over its feasibility.

Given the high incidence of colorectal cancer and the benefits of early detection on treatment and survival, further discussions on establishing population-based CRC screening programs are required. However, these discussions must also consider the effectiveness of screening relative to greater emphasis on prevention.

*Prostate cancer*CANADIAN TASK FORCE ON PREVENTIVE  
HEALTH CARE GUIDELINES

**Prostate Specific Antigen (PSA) testing:** *Exclusion is recommended on the basis of low positive predictive value and the known risk of adverse affects associated with therapies of unproven effectiveness. Fair evidence to exclude routine screening with PSA from the periodic health examination of asymptomatic men over 50 years of age.*

**Digital Rectal Exam (DRE):** *Poor evidence to include or exclude DRE from the periodic health examination (PHE) for men over 50 years of age; while DRE has limitations in its ability to detect early prostate cancer, there is insufficient evidence to recommend that physicians who currently include DRE in their examinations should change that behaviour (1994).*

Prostate cancer is the most frequently diagnosed cancer and the second most common cause of cancer-related deaths among men. In 2000, there were 18,477 newly diagnosed cancer cases and 3,718 deaths attributable to prostate cancer in Canada. While early detection through screening may increase the chances of successful treatment,

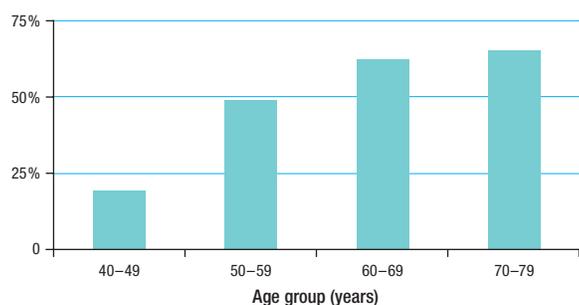
there is currently no screening test for prostate cancer that is recommended by the Canadian Task Force.

Several screening tests, including the prostate specific antigen (PSA) test, digital rectal examination, transrectal ultrasonography and magnetic resonance imaging have been considered to date. The PSA test is a fairly sensitive blood test that measures levels of the PSA protein released from the prostate gland. Prostate cancer is clinically heterogeneous, and although some prostate cancers are aggressive, most are slow growing. Unfortunately, the PSA test identifies not only those cancers that should be treated but also small and slowly growing prostate cancers that would never have caused symptoms in the individual's lifetime. Not only are the detection and treatment of these cancers unnecessary, there is also a risk of substantial complications, including postoperative mortality, incontinence and impotence.

There has been an increase in PSA testing across Canada since the early 1990s. A national survey, conducted by Health Canada, the National Cancer Institute of Canada and the Institute for Clinical Evaluative Sciences in Ontario in 1995, reported that 15% of Canadian men over age 40

# CANCER SCREENING

**Figure 6.**  
Percentage of Canadian men who reported ever having had a PSA test, by age, Canada



Source: Canadian Community Health Survey 2000-2001

had had a PSA test since 1990. Results from the 2001-2002 CCHS indicate that 43% of men over the age of 40 have ever had a PSA test (Figure 6). While most PSA tests are done for the purposes of screening, PSA tests are also used to help diagnose symptomatic prostate cancer and to monitor prostate cancer progression.

In spite of this increase in PSA testing, there is little evidence to suggest that patients who have been screened have better outcomes than individuals who are not screened. While prostate cancer mortality has been declining since the mid 1990s, it is unclear that this is due to screening. The utility of population PSA screening will be determined by two large ongoing screening trials in the U.S. and Europe.

## Emerging technology: genetics and screening for cancer

Cancer is a disease that occurs primarily because of mutations in genes controlling cell growth and DNA repair. There has been a great increase in knowledge of genes and cancer in the last decade, most recently from the Human Genome Project. Genetics may eventually play an important role in screening for cancer, permitting the identification of individuals at risk of a specific cancer, leading to specific screening strategies for individuals or family members.

When genetic information indicates an increased risk of a cancer, those at risk may undergo screening at an earlier age in an attempt to detect a cancer at a more treatable stage. Genetic testing of a person with cancer can help clarify the risk to offspring and serve as the basis for subsequent genetic counseling of the offspring or family with respect to the medical situation and the adoption of strategies to minimize subsequent cancer risk.

Routine DNA-based genetic testing for high-risk genes (such as BRCA 1 or 2 for breast cancer) is currently not practical (or even desirable) in Canada, although it is being made available for high-risk families or individuals in some programs. Even in high-risk families, a negative screening

test is only useful if it is known that the genetic defect being tested for is present in affected family members (i.e. that you are testing for the right gene). In practice, this type of high-risk genetic susceptibility is uncommon, and the proportion of cancers caused by such predisposition is low (about 5% for breast or colon cancer, less for most other cancers, except for retinoblastoma in children). In contrast, it is now appreciated that the genetically determined differences in the way people metabolize chemical carcinogens explain differences in the susceptibility of individuals to cancer. A major research endeavour is currently under way to characterize these genetic differences.

Beyond the high costs of genetic testing, there are also potential problems associated with patient privacy and discrimination. Who should have access to genetic information, and for what purposes should such information be used? The potential for discrimination regarding employment and access to health insurance is considerable, and safeguards against inappropriate use are being developed.

## Future challenges

Screening has the potential to reduce morbidity and mortality through early treatment, as evidenced by the effectiveness of screening for cervical cancer. The primary challenges for cancer screening in coming years is to:

- improve and maximize the use of organized screening programs where such programs exist;
- determine how best to offer population screening for cancers where there is evidence of effective screening tools, but no organized program to support their use;
- continue research into screening methods for which there is not yet sufficient evidence to advocate their use.

## Breast cancer screening challenges

Improving participation rates in organized breast cancer screening programs.

- The relative stability in provincial participation rates in organized screening programs over time suggests that current recruitment methods have reached the maximum level of compliance achievable without major additional efforts.

# CANCER SCREENING

- Expansion of organized breast cancer screening programs and allocation of additional resources for the recruitment of target-aged women could reduce barriers such as lack of access to organized screening or waiting times to access screening.
- A further challenge is to convince physicians to refer their patients to organized screening programs as compared with using the fee-for-service sector.

## **Cervical cancer screening challenges**

- Implementing, when not present, and strengthening, when present, organized cervical cancer screening programs.
- Increasing use of Pap tests among high-risk women.
- There are low-risk women who are being screened more frequently than recommended.
- Increase the screening rate among underscreened older women.
- Recent studies have confirmed that persistent infection with certain serotypes of human papillomavirus (HPV) causes cervical cancer. Determine if HPV testing in conjunction with

Pap tests might be of value if used to identify those with high-risk cervical lesions that require prompt evaluation and possibly treatment, as well as low-risk individuals who could be screened at a longer interval.

- In Canada, HPV-DNA testing is currently being used on a selective basis in three provinces (Newfoundland and Labrador, Quebec and Ontario) as a management triage tool for women with abnormal Pap tests to identify those who need colposcopy. The utility of this approach needs to be determined.

## **Prostate cancer screening challenges**

- Determine the utility of PSA testing.
- If found effective in the ongoing screening trials, determine how best to offer PSA screening on a population basis.

## **Colorectal cancer screening challenges**

- Further research into how to increase participation rates for FOBT.
- Determine if and how to offer population-based FOBT screening programs.

# CANCER TREATMENT

Cancer treatment and outcomes are improving as a result of a better understanding of cancer at the cellular and molecular level and the adoption of therapies proven to be of benefit through clinical trials.

The most striking contributions from treatment over the last two decades have come from:

i) the use of chemotherapy in advanced testicular cancer, ovarian cancer, leukemias and lymphomas, and as a therapy after surgery for breast and colon cancer; ii) the application of high-precision radiotherapy for prostate, head and neck cancer, and other tumour sites; and iii) the greater use of organ-preserving surgical approaches for breast, rectal and laryngeal cancers and for sarcomas of the extremities. In addition, greater focus on supportive care and the introduction of highly effective anti-nausea medications and long-acting analgesics have helped to improve the quality of life of the cancer patient.

## Who provides cancer treatment?

Most provinces have publicly funded agencies that are responsible for managing treatment facilities. Systemic therapy (the administration of chemotherapy drugs, hormones, antibodies vaccines and other agents that can travel



through the body to attack cancer) is provided through cancer centres and treatment facilities outside of the comprehensive cancer centres (e.g. special outreach clinics, or medical oncologists in private practice). Radiotherapy is provided in cancer centres. Surgery (including biopsies) is required to establish the diagnosis in almost all cancers and is the primary form of therapy in over half of all cancers. It is provided through publicly funded acute care hospitals. Supportive care services are provided through a patchwork of hospital, cancer centre and community-based services. Roughly one-half of all cancer patients receive treatment in a cancer centre at some point of their treatment.

The provision of cancer treatment is a provincial and territorial responsibility. A majority of provinces have provincial cancer agencies that are responsible for many aspects of treatment; however,

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even in these provinces, a considerable proportion of cancer treatment occurs in community hospitals that are independent of the agencies. The federal government helps fund health care under the Canada Health and Social Transfer (CHST), and provides primary care for First Nations and Inuit.

Optimal care is best provided by multidisciplinary teams, which may consist of surgeons, radiation oncologists and medical oncologists, working collaboratively with a variety of other health care professionals, including nurses, anaesthesiologists, medical physicists, radiation therapists, pathologists, pharmacists, primary care physicians and supportive care workers. Health Canada has established the Primary Health Care Transition Fund (PHCTF) to support evidence-based innovation related to home care, pharmacare and primary care in an effort to move toward a more integrated health system.

## How is cancer treated?

The first step in the treatment of cancer is diagnosis. Solid tumours are usually diagnosed by taking a tissue biopsy and then examining the tissue under a microscope. After a cancer is diagnosed, it is staged. The stage of a cancer

depends on its size and the extent to which it has spread to other parts of the body. The stage of a cancer helps to determine how it will be treated. A treatment plan is developed. Clinical practice guidelines have been developed for many cancers to help ensure the adoption of therapies proven to be of benefit through experimental (clinical) trials. The three main forms of cancer therapy are systemic therapy, radiation, and surgery. A successful cancer treatment system should improve survival. It should also strive to improve the quality of life of the cancer patient by offering appropriate supportive care, minimizing waiting times and maximizing access to nearby treatment, and be cost-effective.

## Childhood cancer treatment

In contrast to adult cancers, most childhood cancers are treated with chemotherapy and radiotherapy. Childhood cancer is best managed in specialist institutions devoted to the care of sick children. In most provinces, pediatric oncologists working in special units of children's hospitals provide these services. The treatment of childhood cancer has been increasingly successful; for most childhood cancers a cure can be anticipated. With improved survival, the treatment of childhood cancer has moved from a

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focus on saving the life of a child to minimizing the long-term effects of treatment among survivors. Skilled management and the availability of rehabilitation services are crucial to this process.

## **Cancer staging**

Cancer staging is an essential component of cancer control as it provides information to guide health care professionals in treating cancer appropriately. Knowledge of cancer staging also improves communication between health care professionals and patients, allowing patients to better understand the diagnosis, optimal therapy and prognosis. The use of cancer staging data is important to a variety of other stakeholders, including researchers, decision-makers, policy-makers and administrators. Some specific uses of staging data include evaluation of the effectiveness of screening and treatment programs, analyses of cancer prevalence and survival, research into new treatments, and resource planning for health care management.

Currently, collection of staging data within provinces is incomplete and there is no national database of stage information. However, in spite of the complexity of the task, efforts toward establishing a cancer stage database

are underway and are focused on the development of standards, policy, educational tools and the infrastructure necessary to support data collection.

## **Determining appropriate treatment**

The most appropriate therapy for each stage and type of cancer is defined through the systematic study of treatment strategies in clinical trials. The need for clinical trials of new therapies has become greater as many new, potentially effective strategies are emerging from basic laboratory research. Unfortunately, only about 5% of adult Canadians with cancer participate in clinical trials during the course of their illness. This is in contrast to pediatric cancer, in which the vast



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majority of children are treated as part of clinical research protocols. The high level of participation in clinical trials by pediatric patients is attributable, in part, to the fact that tumours in children have been more responsive to treatment, leading to greater successes. In contrast, most adult cancers have proven relatively resistant to treatment. Also, the greater number of adult patients tends to overwhelm treatment facilities, which leads to a lower priority being given to clinical research.

## **Clinical practice guidelines**

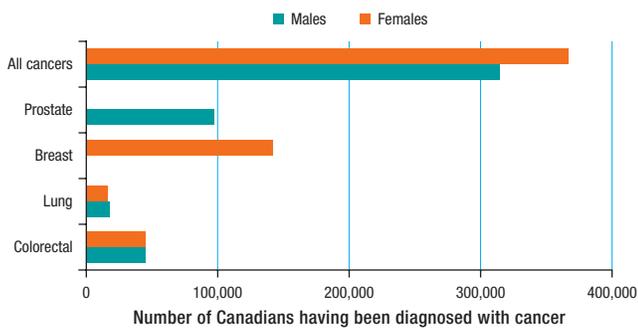
The proliferation of new and effective treatments has created more options for patients and physicians. The large volume of new and sometimes conflicting information on best practices has placed greater emphasis on systematic reviews of the research evidence and the collation and formatting of this evidence into clinical practice guidelines. Clinical practice guidelines are evidence-based documents that assist patients and health care providers in making the most appropriate decisions about an individual patient's care. Several provinces have invested in clinical practice guideline development.

In addition, mechanisms are in place to share guideline development through the *Interprovincial Drug Strategies and Guidelines Group* Internet site and to make completed guidelines available through provincial cancer agency Internet Web sites. Breast cancer guidelines on a number of different topics have been developed through the Canadian Breast Cancer Initiative. The Canadian Strategy for Cancer Control places a high priority on the development of national guidelines for cancer care. At present, there is no mechanism to routinely monitor the consistency of clinical practice with respect to guideline recommendations, although enhancements to provincial information systems may soon enable such studies to be conducted.

## **Increasing demand for diagnostic treatment and services**

The increase in the numbers of patients with newly diagnosed cancer is creating a larger demand for diagnostic and treatment services. Because treatments are improving and benefiting more people with cancer, more individuals are being treated for longer periods of time, resulting in more patients living with cancer (more prevalent cases). In 1998, it was estimated that there were 680,000 individuals

**Figure 1.**  
Prevalence of all cancers and the four most common cancers, by gender, Canada, 1998



(313,000 males, 367,000 females) either living with cancer or survivors of cancer in Canada. The prevalence of all cancers and of the four main cancers is shown in Figure 1. The number of prevalent cases of cancer is estimated to be increasing by 6% to 8% per year and is contributing to the growing burden of cancer care. By 2020, it is projected that the number of cancer patients requiring treatment in Canada will have doubled from the 2001 levels.

### Access

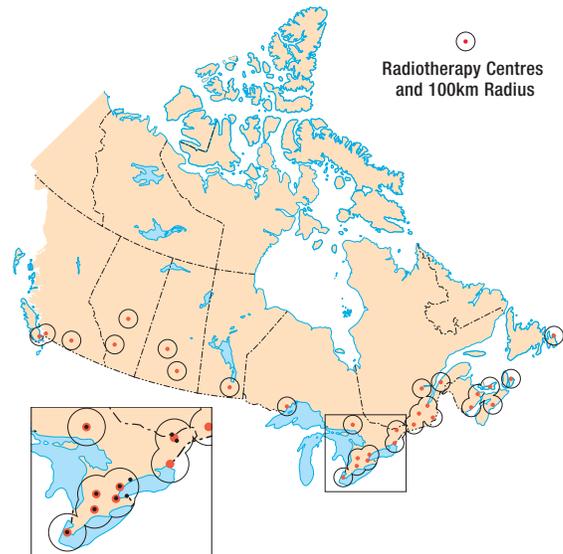
All provinces have dedicated cancer treatment centres for the provision of radiotherapy services. There are 37 radiotherapy centres distributed across the ten provinces; and 75% of the population reside within 100 kilometres of one of these centres (Figure 2). Proximity to a

radiotherapy treatment centre helps to ensure access to appropriate care for curative and palliative treatments.

### Treatment waiting times

Professional associations of cancer specialists in Canada, such as the Canadian Association of Radiation Oncologists and the Canadian Association of Medical Oncologists, have generally recommended that the time a patient waits from referral date to consultation and from the decision to treat to actual treatment should be two weeks or less. Comprehensive, high-quality data on cancer waiting times, or of their effects on survival, do not exist in Canada. However, over recent years, excessive waiting times for

**Figure 2.**  
Radiotherapy centres in Canada, 1996



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radiotherapy have required some provinces to send patients to other provinces or out of the country for treatment.

Excessive waiting is attributable to increased incidence and prevalence of cancer, insufficient facilities (operating rooms, radiotherapy equipment), human resource shortages, inefficient health care delivery systems, increased screening, new clinical care indications, or combinations of these factors. Many programs have been unprepared for the impact of changes in therapy (lumpectomy substituting for mastectomy in the treatment of breast cancer, increasing demands for radiotherapy) or the impact of screening programs, let alone the increase in patient numbers as Canada's population ages. In addition, there are well-documented shortages of many cancer care providers across Canada. The Canadian Association of Provincial Cancer Agencies has identified significant numbers of vacant positions in radiation and medical oncology, medical physics and radiation therapy.

In recent years, provinces have invested in new cancer treatment facilities and equipment to address the growth in caseload. Enhanced efficiency in the cancer system will be achieved with greater integration of services and the implementation of better information systems

that can access clinical information on patients on a regional basis.

## Treatment outcomes

### Declining mortality rates

Improvements in treatment, if generally applied, should translate into reduced mortality from the relevant cancer at the population level, as will effective prevention and screening activities. The relative contribution of different cancer control interventions to the observed decline in mortality rates is difficult, if not impossible, to determine. Nevertheless, treatment is no doubt contributing to the decline in overall mortality rates.

### Relative survival rates

Improvements in outcome after treatment are generally measured in terms of five-year relative survival. Survival rates for the four common cancers relative to rates expected in the general population are available. The five-year relative survival rates were highest for prostate cancer, followed by breast cancer, colorectal cancer and lung cancer (Figure 3). Relative survival rates vary by age group for some cancers and by province. The reasons for the variance in the relative survival rates of cancers are numerous. They include: the extent to which screening programs

are implemented and the use of early detection methods; differences in how aggressively cancers behave; the ability to give treatments to different age groups; the ease of access to treatment; and variations in cancer registry reporting. Although treatment undoubtedly contributes to five-year relative survival, the information on trends over time and the lack of stage-specific data make it difficult to comment on the precise contribution of treatment to the improvements in survival observed. However, with respect to the recent decline in breast cancer mortality, the timing of the decline and the relatively low compliance level for participation in most provincial screening programs suggest that the major reason for the decline is widespread adoption of adjuvant chemotherapy and tamoxifen.

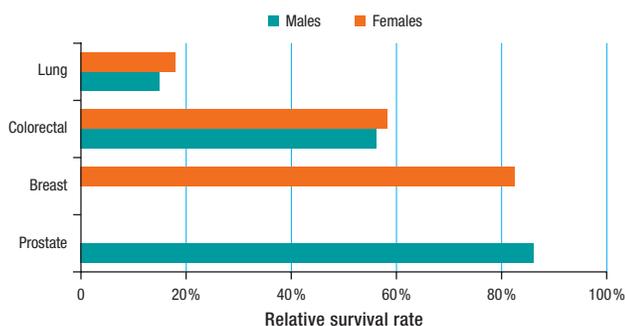
## Costs

The distribution of cancer care costs has shifted, with a sharp decline in the use of hospital resources and a shift in the delivery of care for diagnosis and treatment from inpatient to ambulatory care. This shift was made possible by improvements in postoperative surgical care and the introduction of drugs that sharply reduced the toxic effects of chemotherapy and radiotherapy. There has been a rapid increase since 1998 in the number of expensive but effective drugs used to treat a number of rare cancers, and this trend is expected to continue.

## Lifetime costs

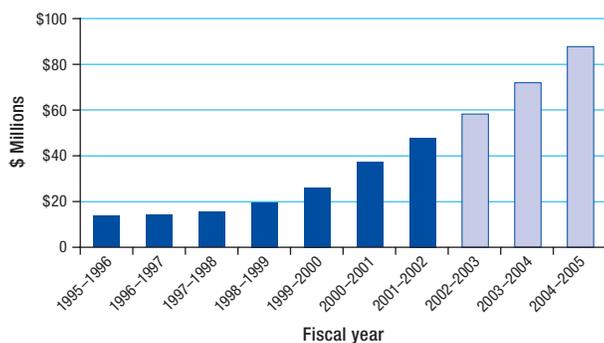
The lifetime costs of cancer care per patient have been estimated to be approximately \$25,000 to \$30,000 for lung, breast and colon cancer. For all three of these cancers, the largest costs are associated with initial diagnosis and treatment (39% to 60%) and terminal care (27% to 45%). Treatment, which makes up a significant component of the total lifetime cost of care, is most influenced by length of hospital stay and, to a lesser extent, whether additional therapies, such as chemotherapy and radiotherapy, are necessary.

**Figure 3.**  
Five-year relative survival rates (%) by major cancer sites for cases diagnosed in 1992, Canada



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**Figure 4.**  
BC Cancer Agency projected growth in provincial cancer drug costs (\$ Millions)



## Anticancer drug costs

The new anticancer drugs are expensive: an average intravenous treatment cycle can cost several thousand dollars, and a course of therapy (generally four to six treatment cycles) can cost anywhere from \$8,000 to \$12,000. As a result of the cost of new intravenous drugs and the expanding indications for their use, expenditures on anticancer drugs in some cancer centres are increasing at a rate of approximately 20% per year (Figure 4). An additional system pressure is emerging in the form of new orally administered agents that effectively target specific cancer cell functions. These agents result in fewer toxic effects than chemotherapy but are also very expensive. A recently introduced drug for chronic myelogenous leukemia costs

approximately \$35,000 per year for an individual patient. The development of similar agents for more common conditions will create enormous pressure on provincial drug funding programs, insurers or individual citizens, and will require the assurance that only effective drugs are introduced into practice outside of clinical trials.

The total drug budget for anticancer drugs in British Columbia (all anticancer drugs) and Ontario (intravenous chemotherapy drugs only) is large and growing, and reached \$37 and \$55 million respectively in fiscal 2000–2001. This expenditure on anticancer drugs, however, is modest compared with what governments are paying for other classes of drugs. In 2000–2001, through its Drug Benefit Program for seniors and those on social assistance, Ontario paid \$143 million for two drugs used to lower blood lipid levels (Zocor® and Lipitor®) and \$85 million for one drug to treat stomach hyperacidity (Losec®).

## Complementary and alternative treatments

Complementary therapies are those therapies that are used along with conventional medical treatments, while alternative therapies are those which are used as cancer treatments in the

place of conventional cancer care. Interest in complementary and alternative medicine (CAM) has greatly increased over the last several years. Estimates of the proportion of cancer patients who use CAM therapies range from 30% to 66%. These therapies include dietary modification and supplementation (e.g. megavitamins, antioxidants), herbal products, acupuncture, massage therapy, exercise, and psychological and mind-body therapies. The widespread adoption of CAM by cancer patients and others has led to the establishment of a number of ongoing clinical trials. Efficacy may be evaluated either in terms of disease progression and survival and/or in terms of palliation, while safety concerns focus not only on direct adverse effects, but also on the risk of interactions with conventional therapies.

There is evidence that some CAM therapies may be harmful when used by cancer patients. St. John's wort may decrease the effectiveness of certain chemotherapeutic agents, while use of antioxidants may decrease the effectiveness of radiotherapy and certain types of chemotherapy. There are also concerns about the use of CAM therapies containing phytoestrogens by women with breast or endometrial cancers.

Randomized trials have demonstrated the benefit of some complementary therapies in controlling cancer pain, anxiety and nausea. For example, there is clear evidence supporting the efficacy of acupuncture in the control of chemotherapy-related nausea and vomiting. Such therapies are increasingly provided at cancer centres.

### **Future challenges**

Despite massive research investments worldwide over the last few decades, improvements in survival resulting from better treatments have been modest. Exceptions include significant improvements in the treatment of certain uncommon cancers, such as Hodgkin's disease, testicular cancer and childhood leukemia. It is unclear whether current optimism regarding therapeutic approaches based on an understanding of the molecular basis of cancer will fare any better than previous "breakthroughs" based on insights into immunology and other areas. Guarded optimism, however, might be appropriate in light of the recent introduction of a handful of new drugs that target cancer-specific molecules and that appear to offer significant advantages over previous therapies.

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## **Significant treatment challenges include:**

- the need to integrate various aspects of treatment services into a streamlined continuum for the individual patient;
- the need to address issues of treatment waiting time and shortages of cancer care providers through coordinated planning to ensure an adequate and even distribution of cancer care professionals across the country. Ideally, this planning would encompass increased numbers of training positions, along with improved retention and recruitment strategies;
- the need for treatment planning to extend to specialists who are critical to treatment service delivery, including oncology pharmacists, as well as those who make the diagnosis of cancer (pathologists) and those who enable cancer surgery to occur (anesthesiologists);
- the need to increase communication between conventional cancer care providers and patients using CAM therapies. This communication would help prevent adverse events and increase overall knowledge of the potential benefits and drawbacks of complimentary and alternative therapies;
- the pressing need to develop strategies to accelerate the number of adult patients participating in clinical trials, so that the large volume of knowledge generated in the research laboratories can be studied in the clinic and transferred into policy and practice, if proven effective.

# PALLIATIVE CARE

Palliative care has recently been defined by the World Health Organization as *“an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.”* The distinction between palliative care and hospice care is often unclear; in Canada, they are often frequently interchangeable. Some would distinguish hospice care as that which is offered in the community rather than in hospitals.

## **Palliative care and Canada’s aging population**

Most palliative care in Canada is provided to patients who have received a diagnosis of cancer. Strategies for supporting and sustaining effective palliative care services will become increasingly important as Canada’s population grows and ages. The Senate Subcommittee Report, *Quality End-of-Life Care: The Right of Every Canadian*, released in June 2000, recommended increased availability of and improved access to services delivered by qualified, interdisciplinary palliative care teams.



The Senate Committee Report also recommended the development of a Canadian Strategy on Palliative and End-Of-Life Care. A Secretariat on Palliative and End-of-Life Care was established in June 2001 within Health Canada to facilitate and coordinate the development of the Strategy. As a first step in strategy development, Health Canada sponsored a national action planning workshop in March 2002. This event brought together 150 experts and stakeholders to discuss priorities and make recommendations on moving forward. The five key areas of focus were identified as: best practices and high-quality care; public information and education; education for care providers; research; and surveillance.

Working groups corresponding to each of these areas were established and are being supported by the Health Canada Secretariat on Palliative

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and End-of-Life Care. The groups are chaired by individuals recognized for their expertise, experience and leadership qualities. Members of each group represent the broad spectrum of palliative and end-of-life care. The Canadian Strategy will reflect a holistic approach and will include broadly accepted core principles. It will also provide an integrated conceptual framework for palliative care and suggested approaches for various aspects of this care, such as clinical practice, pain and symptom relief, surveillance, technology use and assessment tools. The Strategy will also address the particular palliative care needs of specific groups of Canadians, including, for example, immigrant communities, Aboriginal peoples and persons with disabilities.

The Secretariat on Palliative and End-of-Life Care continues to build on the identified priorities in its work, emphasizing collaboration with key stakeholders on this issue. It is working to ensure that palliative care is taken into consideration in all relevant policy initiatives at Health Canada and throughout the federal government. At the same time, palliative care has been identified as one of the five priorities of the Canadian Strategy for Cancer Control. Researchers are also making a priority out of determining how palliative care can be delivered more effectively to cancer patients in need.

## *Integration of palliative care services*

Traditionally, palliative care has been provided by family members. Formalized palliative care in Canada began in 1974–1975 at teaching hospitals in Winnipeg and Montréal. Unlike the traditional models of private hospices developed in the U.K., and then in the U.S., Canadian palliative care services tend to incorporate a palliative consultation team within institutions and home care services. Today, these programs continue to evolve and are increasingly integrated across a variety of institutional and community-based health care settings. Although hospice care is usually provided in the patient's home, care is also provided in freestanding hospice centers, hospitals, and nursing homes and other long-term care facilities. While individual programs vary, most aim to provide a comprehensive range of services using an interdisciplinary team approach that involves doctors, nurses, pharmacists, social workers, spiritual advisors and volunteers. It has also been increasingly appreciated that palliative care services do not just have an end-of-life role, though that becomes increasingly important with time. Palliative care should be available from the beginning of treatment, especially for those recognized as not eligible for curative therapy.

## Palliative care programs

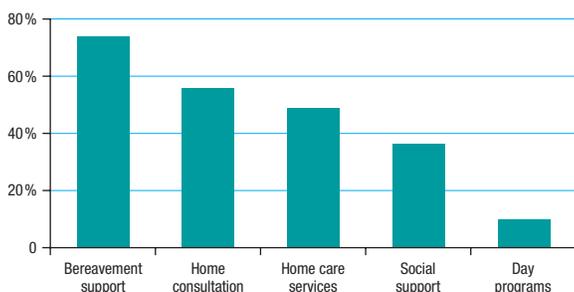
Palliative care programs in Canada offer a comprehensive range of services that may include: 1) relief from pain and other symptoms; 2) psychological and spiritual care; 3) a support system to help patients live fully until death; and 4) support and bereavement for families. According to surveys conducted by the Canadian Hospice Palliative Care Association (CHPCA), the number of palliative care programs has increased steadily — from 118 programs in 1981 to more than 600 in 2002. In 1997, the majority of these programs offered bereavement support services, and about half provided home consultations by a health care professional and home care. However, relatively few programs delivered day programs for respite or hospice care (Figure 1).

## Creating options for patients

Given the option, many people would prefer to die at home. Traditionally, a dying cancer patient spends his or her last few months in hospital, often relatively isolated from loved ones. A home death provides an atmosphere of comfort among people and surroundings that are familiar. The percentage of hospital cancer deaths has generally been in decline since the early 1990s (Figure 2). However, currently, more than three out of four Canadian cancer patients die in hospital. With the implementation of a comprehensive regional palliative care program, more cancer patients should have the option of dying at home.

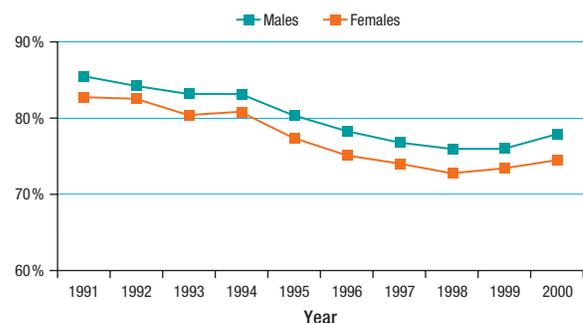
In Edmonton, such a program was established in 1995–1996, and this has led to a number

**Figure 1.**  
Frequency of the type of services offered by palliative care programs in Canada, 1997



Source: 1997 Directory of Services, Canadian Palliative Care Association  
N = 501 programs

**Figure 2.**  
Percentage of hospital cancer deaths, by gender, Canada, 1991–2000



Source: Vital Statistics Database, Statistics Canada

## PALLIATIVE CARE

of changes. The proportion of terminal cancer deaths occurring in acute care hospitals has been reduced from 86% to 49%, and the proportion of home deaths has increased from 10% to 21%. The proportion of terminally ill cancer patients receiving palliative care rose from 23% to 84%. The number of inpatient hospital days has also dropped dramatically, from 24,566 to 6,960 days, reflecting a shift to treatment provided in hospices and at home. As experience suggests, such shifts benefit patients and their families and should be encouraged. One important consequence would be a switch of resources, given that funding for hospitals and home care tends to come from different budgets.

### ***Applying palliative care principles to childhood cancer***

The majority of children with cancer in Canada will survive their disease, but the treatments and procedures involved in curing them can be painful and may have a negative immediate impact on quality of life. Applying the principles of palliative care, such as good pain and symptom management and psychosocial support for the child and family from the time of diagnosis, can assist in improving the quality of life for children with cancer.

Chronic and often terminal pain requires multidisciplinary pharmacological, behavioural and nursing support that can often be delivered to children in the home using long-acting opioids and symptom control. Rehabilitation services also have a role for those who experience complications from treatment. For example, there is a Pediatric Palliative Care Service in Halifax, which consists of a full time physician and clinical nurse specialist who, through consultations, assist the oncology team in providing care to children and families. The service has worked with 89 families over a 4-year period (January 1998 to January 2002). Generally, the service is consulted when there are hard-to-manage symptoms or when the child and family wish to receive end-of-life care at home or at a hospital located closer to home.

### ***Providing pain relief to those with cancer***

The World Health Organization has promoted a three-step analgesic "ladder" to recognize the increasing requirements for pain relief of many patients as their disease progresses. Drugs of the non-steroidal anti-inflammatory class (NSAIDs) such as Aspirin® and analogues may initially suffice. If pain becomes more severe,

# PALLIATIVE CARE

however, an opioid for mild to moderate pain, such as codeine, should be prescribed. If this fails to relieve the pain, there should be no hesitation in prescribing morphine, usually in its orally administered form.

There is no standard dose for opioid drugs — the “right” dose is the dose that relieves the patient’s pain. Regular provision of morphine is essential for adequate pain relief, and the schedule of administration required should be determined for each patient. While palliative care specialists understand this requirement, other health care professionals, both in hospital and at home, may need special instruction to ensure that unrelieved pain does not occur. It has been estimated that 30% or more of cancer patients suffer from unrelieved pain, and thus it should be a priority in all areas of Canada to reduce

this to the absolute minimum. It was estimated from a study in the United States that relief from cancer pain can be achieved in about 90% of patients.

## *Medical training in palliative care*

Palliative care requires specialized training in addressing pain and discomfort. It also requires a thorough understanding of the physical, emotional, social and spiritual impact of dying on the individual, family and friends. In spite of these requirements, some health care professionals are not adequately trained to recognize and manage cancer-induced pain. In 2002, there were 165 palliative care specialists in Canada who were members of the Canadian Society of Palliative Care Physicians. The availability of these physicians varies by region, although differences may occur because not all qualified physicians are members of this association, especially in Quebec. Palliative care may also be delivered by trained family practitioners, by specialists in other medical disciplines and, both in hospital and at home, by specially trained nurses.



# PALLIATIVE CARE

**Table 1.**  
Percentage of Canadian medical schools offering undergraduate and postgraduate palliative care training

Palliative care training	Undergraduate	Postgraduate
Mandatory program	12.5%	31.3%
Elective program	68.8%	100%

Source: Moloughney B.W. Canadian Undergraduate Medical Education in Palliative Care. Report to the Cancer Division, Health Canada, 2002

In a survey of physicians who identified themselves as being involved in pain management, palliative care or oncology, 28% rated their pain management training as poor, and only 5% rated it as excellent. Of the oncologists surveyed, 73% ranked their graduate training in pain management as fair or poor. Survey respondents indicated that the limiting factor in pain management is not the unavailability of analgesics, analgesic techniques or tools, but the under-use of these techniques.

In 1991, the Canadian Palliative Care Curriculum was published and distributed to all Canadian medical schools. Designed specifically for undergraduate medical training, the curriculum outlines the objectives of palliative care instruction. Despite this incentive, palliative care instruction appears to be minimal.

To assess the current state of palliative care instruction, all 16 medical schools in Canada were surveyed (Table 1). Most of the schools offered elective programs in palliative care, but only a small proportion of students participated in these programs. Only two of the undergraduate programs and five of the graduate programs had mandatory training in palliative care. For undergraduate medical programs, 15 of the schools surveyed offered an average of 11 hours of instruction. Most of this curriculum was taught by full-time palliative care specialists, and the training occurred during the first two years of medical school. The curriculum included pain assessment and management, with an emphasis on development of communication skills. This current, somewhat restrictive level of palliative care training in Canadian medical schools may limit the ability of physicians to adequately identify and deal with issues of pain and suffering in their patients.

## Future challenges

### Medical and nursing training

As Canada's population rapidly ages, there is a critical need to address inadequacies in medical and nursing training for palliative care, particularly in pain control and management.

Currently, there are insufficient programs in place to train all needed health care workers. However, the CHPCA recently completed development of a training program that could have a significant impact on palliative care across Canada. The *Palliative Care for Support Workers Training Program* has trained more than 2,100 support workers in five different provinces. In addition, 140 health care practitioners have been trained as palliative care instructors for future training programs. As a result, new training programs are being established in Alberta, Manitoba, Ontario, Prince Edward Island and Newfoundland and Labrador.

### **Data collection and palliative care integration**

There is also a critical need to collect surveillance data, evaluation indicators and performance measures to help facilitate the integration of palliative care programs across Canada. This integration is essential because common tools are crucial to planning, evaluating and monitoring appropriate care at the end of life to ensure that optimal services are available to provide high-quality, end-of-life care to all Canadians dying of cancer.

Regional data should be collected on the extent to which pain is relieved, and remedial action should be taken if the findings are unacceptable. This may require special research projects to determine how pain control may be most effectively delivered.

A palliative care directory is being established in response to this need. The *Canadian Directory of Hospice Palliative Care Services* was developed to collect relevant information from all hospice palliative care programs that offer services across Canada (in all provinces and territories), including hospital, hospice and community-based services provided to patients and families regardless of diagnosis or disease. Statistics collected include the number of programs in Canada and where they are located, the number providing various services and the types of patients served, and estimates of approximate case-loads, capacity and annual numbers of patients.

## CONCLUSION and FUTURE DIRECTIONS

This *Progress Report on Cancer Control in Canada* shows that there have been substantial changes in cancer control over the past several decades.

In many areas, significant progress has been made. Taken as a whole, mortality rates for all cancers combined have declined among both men and women since the late 1980s, primarily as a result of decreasing mortality rates from breast, prostate and colorectal cancer. Changes in diet are believed to at least partly explain declines in colorectal cancer, while, in general terms, people with cancer are surviving longer as a result of early detection and improved treatments.

Perhaps the most important progress has been the falling prevalence of cigarette smoking. This has led to declining lung cancer rates in males, and it is anticipated that similar declines for females will be observed within the next decade. Progress in this and other areas is attributable in large part to effective cancer prevention initiatives. Recent genetic research holds promise for better treatments in the future.

Despite these successes, Canada faces significant challenges in cancer control. Although there is much that we do not know about the causes of cancer, there is much that we do know but are failing to apply.

While incidence rates for some cancers in Canada are falling, the absolute numbers of new cases requiring treatment is increasing by approximately 3% per year due to the growth and aging of the Canadian population. This demographic trend will accelerate over the next decade, placing a heavy demand on Canada's cancer control system. Future cancer control initiatives must therefore address the need for increased treatment capacity and better integration of palliative care programs across the country.

Improved efforts in cancer prevention are critical to future success in cancer control. Federal, provincial/territorial and municipal governments, along with non-governmental organizations across society, are taking the prevention message to Canadians through a broad population health approach, stressing healthy lifestyles as the best means of preventing cancer and other chronic diseases. Work must continue to ensure that disease prevention and health promotion become ingrained as basic societal values.

On a larger scale, by means of the Canadian Strategy for Cancer Control, there is a movement to better integrate cancer control activities through both national and provincial cancer control planning. Efforts are also being made to develop more coherent approaches that

# CONCLUSION and FUTURE DIRECTIONS

incorporate improved surveillance and the identification and implementation of best practices in prevention and control.

## **Future directions in key activity areas**

### ***Prevention***

- More research into the causes of cancer and the effectiveness of prevention programs will enhance the evidence base for the development of more effective programs and services.
- We need to better apply what we currently know to help individuals make appropriate lifestyle choices, such as consuming healthier diets, becoming more physically active, not smoking cigarettes, and maintaining healthy body weights.

### ***Screening***

- Efforts should be made to increase participation in organized breast and cervical screening programs.
- Determine how best to offer population screening for cancers where there is evidence of effectiveness, but as yet, no organized program.

- Continue research into screening methods for which there is not yet sufficient evidence to advocate their use.

### ***Treatment***

- Cancer patients should have improved access to seamless cancer care, where appropriate diagnostic and treatment services are made available with minimal delay.
- The current shortage of oncology specialists should be rectified and training improved to ensure that sufficient specialists are available to cope with the expanding number of cancer patients seeking care.
- Greater participation of adult cancer patients in clinical trials of cancer treatments should be encouraged.
- Efforts should be made to ensure that all cancer patients receive the benefits of established advances in cancer treatment and that these benefits are made available at an affordable cost.

### ***Palliative care***

- There should be greater emphasis on promoting wider adoption of the principles of palliative care and on the provision of health professionals with the necessary skills to provide such care.

# GLOSSARY

## of Terms and Definitions

### **Benign**

Generally applied to a tumour or neoplasm that is not malignant. Benign tumours don't spread to other organs, which is their main distinction from malignant tumours (cancer).

### **Cancer**

A malignant tumour or neoplasm. Malignant tumours have the propensity to spread either locally or through the lymphatic system or blood stream, to other organs. Cancers are usually defined by the name of the organ from which they arise, e.g., breast cancer, but sometimes by the type of cells comprising the cancer (e.g. leukemia, arising from primitive blood cells).

### **Cancer continuum**

The spectrum of cancer-related experience, including prevention, early detection, diagnosis, treatment, living with cancer, and end of life.

### **Cancer control**

The totality of measures taken to reduce the impact of cancer, including prevention, early detection and screening, treatment, rehabilitation, and palliative care.

### **Cancer treatment**

Specific treatment measures taken to cure cancer, or ameliorate its major effects. Cancer treatment includes surgery, radiation therapy, chemotherapy, hormone therapy, and pain relief measures.

### **Carcinogen**

A chemical, infectious or physical agent that can cause cancer.

### **Carcinoma**

A cancer that arises from epithelial tissue (the lining of an internal organ or the skin).

### **Chemotherapy**

The use of a chemical or chemotherapeutic agent to treat cancer or to limit its further progress.

### **Clinical breast examination (CBE)**

The process of examining the breasts by a carefully trained health professional in order to detect early signs of breast cancer, when potentially still curable.

### **Clinical trial**

A research activity used to evaluate the efficacy and safety of promising approaches to disease prevention and control. Interventional trials determine whether experimental

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treatments or new ways of using known therapies are safe and effective under controlled environments. Observational trials address health issues in large groups of people or populations in natural settings.

### **Complementary and alternative medicine (CAM)**

Complementary and alternative medicine refers to a broad range of therapies used both to treat and prevent disease that are not considered to be part of conventional medicine.

### **Crude (death) rate**

The portion of a defined population that died during a specified period. The word “crude” is used to distinguish this measure from a rate that has been adjusted for differences in the age structure of populations (i.e. an age-standardized rate.)

### **Diagnosis**

The identification of a disease or health condition, or the name of the disease or condition.

### **DNA (deoxyribonucleic acid)**

The biochemical carrier of genetic information; the constituent material of all genes.

### **Epidemiology**

The study of the distribution and determinants of diseases in humans.

### **Genes**

The functional unit of heredity, genes are composed of DNA sequences. They are located within the chromosomes, and determine particular characteristics of an individual.

### **Genetic testing**

Analyzing an individual's genetic material to diagnose a genetic disease or condition, or to determine a predisposition to a particular health condition.

### **Genetics**

The study of heredity and the variability of inherited traits.

### **Genome**

The genetic material of an individual.

### **Guidelines**

A formal statement directing a defined task or function. Examples include clinical practice guidelines and guidelines for the ethical conduct of medical research.

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### **Human genome project**

An international project designed to identify the totality of the sequences of human genes.

### **Incidence**

The frequency of occurrence of any event or condition in a defined population over a defined period of time.

In this report incidence is the total number of new cases of cancer diagnosed in a particular year expressed as the rate of new cases per 100,000 individuals in the population. In the figures provided, all incidence rates have been age-standardized to the 1991 Canadian population to ensure comparability across years.

### **Mammography**

The use of x-rays to create a picture of the breast (mammogram) to help diagnose and localize breast cancer.

### **Morbidity**

The state of being diseased or ill.

### **Mortality rate**

The portion of a defined population that dies during a specific period. For cancer, this is expressed as the number of cancer deaths per 100,000 people per year. As was the case for

incidence, mortality rates in this report have been age-standardized to the 1991 Canadian population.

### **Oncology**

The branch of medicine dealing with cancer.

### **Outcomes**

All the possible changes in health status that may result from exposure to a causal factor or from the handling of a health problem.

### **Palliative care**

Palliative care is the active total care of patients whose disease is not responsive to curative treatment. Control of pain, of other symptoms, and of psychological, social and spiritual problems is paramount, to achieve the best possible quality of life for patients and their families.

### **Pap smear**

A screening test to help identify malignant or pre-malignant changes in the cervix. It is performed by obtaining cells from the exterior of the cervix uterus, staining them with a special technique derived by Papanicolau (hence the Pap test), and examining them under a microscope. (Alternative name: pap test).

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### **Population-based**

Pertaining to a defined population.

### **Population health**

Population health is an approach that aims to improve the health of the entire population and to reduce health inequities among population groups by acting upon the broad range of factors and conditions that have a strong influence on health.

### **Potential years of life lost (PYLL)**

PYLL is a measure of premature mortality that represents the number of years of life “lost” when a person dies prematurely from any cause. For example, if one assumes a life expectancy of 75 years, the PYLL for a person dying at age 25 would be 50.

### **Precursor**

A condition or state preceding the overt, pathological onset of a disease. Precursor states may sometimes be detectable by screening, or may be used as a risk marker.

### **Predictive value**

In screening and diagnostic tests, the probability that a person with a positive test is a true positive (i.e. does have the disease) is referred to as the “positive predictive value of the test.” The

predictive value of a negative test is the probability that a person with a negative test does not have the disease.

### **Prevalence**

The number of cases of disease in a population, at a defined point in time, irrespective of the time of diagnosis. It is usually expressed as the number of cases of disease per 100,000 individuals in the population. It is a measure of the total burden of disease in a population.

### **Prevention**

Actions aimed at eliminating or minimizing the impact of disease and disability.

### **Quality-of-life**

A measure of the extent a patient is free from pain or disability caused by disease, and the extent he or she is able to perform the normal functions of life unaided.

### **Rate**

A measure of the frequency of occurrence of a phenomenon. A rate is an expression of the frequency with which an event occurs in a defined population in a specified period of time.

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### **Relative survival**

Relative survival is the ratio of the proportion of observed survivors in a cohort of cancer patients to the proportion of expected survivors in a comparable set of cancer-free individuals.

### **Risk factor**

An exposure or genetic characteristic that is associated with a health-related condition.

### **Screening**

Screening is the process by which unrecognized diseases are identified by tests that can be applied rapidly on a large scale. Screening tests sort out apparently healthy people from those who may have a disease. A screening test is not intended to be diagnostic; rather, a positive finding will have to be confirmed by special diagnostic procedures.

### **Screening mammogram**

A screening mammogram is an x-ray of the breast used to detect breast changes in women who have no signs of breast cancer. It usually involves two x-rays of each breast.

### **Staging (cancer)**

Cancer staging systems describe how far cancer has spread and put patients with similar prognosis in the same group. In overall stage

grouping, there are four stages. In general, stage I cancers are small localized cancers that are usually curable, while stage IV usually represents inoperable or metastatic cancer. Stage II and III cancers are usually locally advanced and/or with involvement of local lymph nodes.

### **Statistics**

The science of collecting, summarizing, and analyzing numerical data. The term is also applied to the data themselves.

### **Surveillance**

Systematic ongoing collection, collation, and analysis of data and the timely dissemination of information to those who need to know so that action can be taken.

### **Tumour**

A new and abnormal formation of tissue, as a lump or growth. Tumours may be benign (rarely life-threatening) or malignant.

### **Trend**

The general direction (for example, rising falling or stable) of change over time.



