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Health Canada / Santé Canada

Steering Committee Members:

John R. McLaughlin (Chair), Ph.D.
Division of Epidemiology and Statistics, Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, Ontario

Dagny Dryer, M.D., F.R.C.P.C.
PEI Oncology Clinic and Tumour Registry, Prince Edward Island

Anthony L.A. Fields, M.D., F.R.C.P.C.
Cross Cancer Institute, Edmonton, Alberta

Yang Mao, Ph.D.
Cancer Bureau, Laboratory Centre for Disease Control, Health Canada

Ghislaine Villeneuve, M.P.A.
Health Statistics Division, Statistics Canada

Barbara Whylie, M.B., B.Ch., B.A.O.
Medical Affairs and Cancer Control, Canadian Cancer Society and National Cancer Institute of Canada

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Additional copies may be requested from Divisions of the Canadian Cancer Society, Statistics Canada, or the Cancer Bureau, Health Canada (see pages 77 to 80).

Version française de cette publication disponible sur demande.

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The production and distribution of the monograph is the result of collaboration among all these groups.

- The provincial and territorial cancer registries supply the cancer incidence data used to produce the statistics in this report. The Committee wishes to acknowledge the essential contribution of the staff at the registries.
- Michel Beaupré of the Fichier des tumeurs du Québec reviewed the French translation. Dr. Françoise Bouchard of the Cancer Bureau, Laboratory Centre for Disease Control (LCDC), reviewed the French translation and contributed to the Special Topic, Progress in Cancer Control. The Cancer Bureau, LCDC, Health Canada, produced the estimates, trends, projections, tables and figures for all sections of the document. Other analyses include producing the probabilities of developing and dying of cancer, calculations of premature mortality, and the contribution of risk factors to cancer. The work of generating these analyses carried out by Robert Semenciw, Chris Waters and Les Mery is particularly appreciated. Dr. Howard Morrison contributed to the sections on childhood cancer statistics and Progress in Cancer Control. Ms. Fadia Gharib's administrative support is also gratefully acknowledged.
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INTRODUCTION

This monograph is published by the Canadian Cancer Society and the National Cancer Institute of Canada in collaboration with Health Canada, Statistics Canada, provincial/territorial cancer registries and university-based researchers. It is part of an annual series that began publication in 1987.

The main purpose of the publication is to provide health professionals, researchers and policy-makers with detailed information regarding the incidence and mortality of the most common types of cancer by age, gender, time period and province or territory. It is hoped that these data will stimulate new research and assist decision-making and priority-setting processes at the individual, community, provincial and national levels. The monograph is also used by educators, the media and by members of the public with an interest in cancer.

Special Topics are included each year. This year the Special Topic is "Progress in Cancer Control". In past years, other Special Topics included:

- an analysis of the relative impact of population growth and aging on cancer incidence in Canada (1999);
- a review of current directions in cancer surveillance in Canada (1999);
- international comparisons (1998);
- a comparison of cancer in Canada from 1987 to 1997 (1997);
- an evaluation of the accuracy of previously reported estimates (1996);
- detailed reviews of prostate cancer (1996), colorectal cancer (1995) and breast cancer (1993);
- survival rates (1991-1993, 1995);
- prevalence estimates (1995);
- smoking prevalence and lung cancer (1991);
- cancer in Aboriginal populations (1991);
- age-specific trends among women (1990);
- cancer rates by income level (1990); and
- the economic burden of cancer (1990, 1996).

Information on cancer incidence and mortality comes from the provincial and territorial cancer registries and offices of vital statistics, which send their data to Statistics Canada for compilation at the national level. The process of collecting complete information about cancer cases in each province and then compiling this information at the national level results in a considerable delay before reliable information for a particular year is available for all of Canada. This report contains actual rates and frequencies up to the most recent year for which complete data are available (1995 for incidence; 1997 for mortality) and, in addition, estimated values for the years up to 2000. The estimates are made in the following way: first, time trends in the known rates are examined; second, these trends are projected to the present time to obtain current rate estimates; and third, these rate estimates for the current year are applied to current population estimates.

The statistical methodology used for this edition is the same as that used from 1995 to 1999. The standardization of incidence and mortality rates is based on the 1991 Canadian population rather than the World Standard Population. Age-standardized rates are higher with this methodology because the Canadian population has a higher proportion of older people, among whom cancer is more common. Standardization using the Canadian population provides results that are more relevant and useful to those concerned with cancer in Canada. **Nevertheless, it should be noted that it is**

not appropriate to compare the age-standardized rates presented here with those from publications that employ a different standard population.

Details of the statistical methods used to produce the projections are described in *Appendix I: Methods*. **It is important to emphasize that the figures provided for 2000 are estimates, rather than actual data.**

The statistics contained herein refer to all types of cancer, defined according to the standardized classification that is used worldwide. As is customary in reports from cancer registries, the statistics exclude skin cancers other than melanoma. Benign tumours and carcinoma in situ are also excluded. Details of how cancer sites are classified and definitions of technical terms are provided in the *Glossary*.

Individuals who require additional information can refer to the section entitled *For Further Information*, which indicates how to contact the various agencies involved, including Health Canada, Statistics Canada, the Canadian Cancer Society, the National Cancer Institute of Canada, and provincial and territorial cancer registries. Related information can also be found in other publications, including reports from provincial and territorial cancer registries; Cancer Incidence in Canada, 1969-1993, and Health Reports, published by Statistics Canada; Chronic Diseases in Canada and the Canadian Cancer Incidence Atlas, published by Health Canada; a collaborative monograph entitled The Making of the Canadian Cancer Registry; Cancer Incidence in North America, published by the North American Association of Central Cancer Registries; and Cancer Incidence in Five Continents, published by the International Agency for Research on Cancer.

The development of this publication over the years has benefited considerably from the comments and suggestions of readers. The Steering Committee appreciates and welcomes such comments, including ideas on how the report can be improved (an ***Order and Evaluation Form*** is included on the final page of this report). Finally, **readers can be included on the mailing list for next year's publication by completing the *Order and Evaluation Form*.**

Current Incidence and Mortality

An estimated 132,100 new cases of cancer and 65,000 deaths from cancer will occur in Canada in 2000.

In 2000, the most frequently diagnosed cancers will continue to be breast cancer for women and prostate cancer for men.

Lung cancer remains the leading cause of cancer death for both genders. Almost one-third of the cancer deaths in men and almost one-quarter in women are due to lung cancer alone.

Trends in Incidence and Mortality

Among men the cancer mortality rate for all cancers combined has been declining slowly since 1988 as a result of decreases in mortality rates for lung, colorectal, and certain other cancers.

From the 1970s to the present, among women, there has been a steady and significant decline in mortality rates for all cancers other than lung cancer.

Among Canadian men, prostate cancer will continue to be the most frequently occurring cancer in 2000. Beginning in 1994, incidence rates for prostate cancer began to decline after increasing rapidly for several years. With mortality rates remaining stable during this period, these trends were likely due to the rapid increase in the use of early detection techniques (such as measurement of Prostate Specific Antigen levels).

Lung cancer incidence and mortality rates among women continue to increase rapidly and are now more than four times as high as rates in 1971. However, they remain only a little less than half as high as rates among men.

Breast cancer incidence among women rose steadily over the past three decades, although the rate of increase is declining somewhat, whereas mortality rates for breast cancer declined slightly since 1986 and particularly since 1990. This pattern of divergent trends is consistent with benefits being achieved through screening programs and improved treatments.

For colorectal cancer, the third most common cancer for both men and women, both incidence and mortality rates have declined steadily over the past decade and a half, the rate of decline being more pronounced among women.

Thyroid cancer is a relatively rare disease, which in the past decade has had the most rapidly increasing incidence rate among women. The rate of increase is less pronounced in men, and mortality rates for both men and women remained quite stable.

Mortality rates for Hodgkin's disease and for testicular cancer are dropping rapidly.

Age and Gender Distribution of Cancer

Cancer is primarily a disease of older Canadians, with 70% of new cancer cases and 82% of deaths due to cancer occurring among those who are at least 60 years old.

After age 70, the rate at which men die from cancer is higher than the rate at which women develop cancer.

HIGHLIGHTS

Probability of Developing/Dying from Cancer

During their lifetimes, 2 in 19 women are expected to develop breast cancer, 1 in 18 will develop colorectal cancer, and 1 in 20 will develop lung cancer.

Among men, 1 in 9 will develop prostate cancer during their lifetime, mostly after age 70, 1 in 11 will develop lung cancer and 1 in 16 will develop colorectal cancer.

The probability of developing cancer is lower for younger people, such that over the next 10 years it is 1 in 90 among 30-year-old women but 1 in 8 among 70-year-old women. The probability of developing prostate cancer during the next decade among 70-year-old men is 1 in 16, which is the highest level of 10-year risk for all cancers and both sexes.

Potential Years of Life Lost Due to Cancer

Cancer is the leading cause of premature death in Canada, being responsible for almost one-third of all potential years of life lost.

Because of its relative frequency among younger Canadians and poor survival rates, lung cancer is by far the leading cause of premature death due to cancer.

Smoking is responsible for about one-third of potential years of life lost (PYLL) due to cancer, about one-quarter of PYLL due to diseases of the heart and about one-half of PYLL due to respiratory disease.

Cancer in Children Aged 0-19 Years

In recent years, an average of 1,279 Canadian children were diagnosed with cancer and 249 died from cancer each year. The most common childhood cancer is leukemia, which accounts for over 26% of new cases and 32% of deaths.

Progress in Cancer Control

Since 1986 lung cancer mortality rates among men have declined by 24% following the pattern of reduced smoking of tobacco.

Cancer mortality rates among children have declined by more than 50% since the 1950s.

Since 1985, breast cancer mortality rates have declined by about 20 per 100,000 or 25% among women aged 50-69 years.

The importance of different forms of cancer in Canada in the year 2000 can be expressed by three measures, shown in Table 1. **Incidence** is expressed as the number of new cases of a given type of cancer diagnosed per year. **Mortality** is expressed as the number of deaths attributed to a particular type of cancer during the year. **The deaths to cases ratio** (the number of deaths divided by the number of new cases) is a crude indicator of disease severity. The closer a value is to 1.0, the poorer the prognosis for that cancer. Frequencies listed in Tables 1 to 6 are estimates based on modelling trends in cancer and population data since 1986 for both cancer incidence and mortality (incidence estimates for prostate cancer were modelled using data from 1980-1989). These **estimates** are rounded to the nearest 5, 10, 50 or 100. Readers requiring actual data or information on less common sites of cancer may refer to Tables 1 and 2 in *Appendix II* or to source publications.[1,2]

Some problems that may be inherent in using these statistics are considered below.

Sources of Data

Incidence figures collected by provincial and territorial cancer registries are reported to the Canadian Cancer Registry (CCR) maintained by Statistics Canada, beginning with cases diagnosed as of 1992. The patient-oriented CCR has evolved from the event-oriented National Cancer Incidence Reporting System, which collected data from 1969-1991. The new CCR is regularly updated, it is internally linked to track patients with tumours diagnosed in more than one province, and its records are linked to death certificates. Data from these series are published by Statistics Canada[1] and by the North American Association of Central Cancer Registries,[3] every five years by the International Agency for Research on Cancer,[2] and in occasional reports.[1,4]

Every effort is made to count all newly diagnosed cases of cancer among people who reside in a given province at the time of diagnosis, and to accurately and consistently record for each case the site and histological type of cancer from pathology reports and other records, according to definitions in the CCR Data Dictionary. Cancer sites included in this report are defined according to the groupings listed in the *Glossary*. Although the provincial cancer registries strive, through the Canadian Council of Cancer Registries and its Standing Committee on Data Quality, to achieve uniformity in defining and classifying new cases, reporting procedures may still vary across the country. This is particularly true for skin cancer (other than melanoma), which occurs frequently but is difficult to register completely because it is usually treated successfully without requiring hospitalization or the review of a pathologic specimen. **For this reason, all tables in this monograph exclude the estimated 68,000 cases of non-melanoma skin cancer for Canada in 2000.*** Registration levels for cancer have become more comparable across the country, particularly in the period between 1981 and the mid-1980s, as registries standardized their procedures for case-finding, including linkage to provincial mortality data files.

Cancer mortality statistics are derived from death records maintained by the provincial and territorial registrars of vital statistics for persons residing in that province or territory at the time of death. Cancer deaths are those attributed to some form of cancer as the underlying cause of death by the certifying physician.

* *The number of new cases of non-melanoma skin cancer is estimated using incidence rates from the cancer registry in British Columbia, which is considered to have the most complete data. Please refer to Appendix I: Methods for further details.*

Although these procedures have been standardized both nationally and internationally, some lack of uniformity is inevitable. The description of the type of cancer provided on the death certificate is usually less precise than that obtained by the cancer registries from hospital and pathology records. Also, cancer deaths occurring in a given year will usually be the result of cancers diagnosed in previous years.

Estimates for Cancer Incidence and Mortality, Canada, 2000

An estimated 132,100 new cases of cancer and 65,000 deaths from cancer will occur in Canada in 2000. Men outnumber women for both new cases and deaths, by 5.6% for incidence and 13.8% for mortality (Table 1).

Three types of cancer account for at least 50% of the new cases in each sex: prostate, lung, and colorectal cancers in males, and breast, lung, and colorectal cancers in females. Almost one-third of the cancer deaths in men and almost one-quarter in women are due to lung cancer alone (Figures 1.1 and 1.2).

Lung cancer will continue as the leading cause of cancer death among Canadian women in 2000, accounting for an estimated 7,000 deaths, as compared with the 5,500 deaths expected for breast cancer. This reflects the rapid increase in lung cancer mortality rates among women over the past decade, while age-standardized breast cancer mortality has declined slightly. Lung cancer incidence among women also continues to rise. With an estimated 8,400 new cases, lung cancer is women's second leading form of cancer incidence, just ahead of the 7,900 new cases expected for colorectal cancer, which ranks third. Breast cancer continues to lead the incidence data for Canadian women, with more than twice as many new cases as lung cancer.

Among Canadian men in 2000, prostate cancer will continue as the leading form of cancer in terms of incidence, with an estimated 16,900 newly diagnosed cases, as compared with 12,200 lung cancers. The rapid increase in the numbers of prostate cancers detected in all provinces a few years ago resulted from the widespread rise in the use of earlier detection techniques. The downturn in new cases recently seen in some provinces indicates that the recent dramatic increases in prostate cancer incidence will not continue. To reflect this, the number of new prostate cancer cases was derived from an earlier period (see *Appendix I: Methods*) and can be viewed as a conservative estimate of the number expected in 2000.

Lung cancer will remain the leading cause of cancer death among Canadian men in 2000; the estimated 10,700 lung cancer deaths far exceed the 4,200 deaths due to prostate cancer, the second leading cause of male cancer death.

Deaths to Cases Ratio

The ratio of deaths to new cases, at 49% overall, is slightly higher in males than in females. On the basis of these ratios, the cancer sites listed in Table 1 could be classified arbitrarily into three groups: those with a very good prognosis (a ratio of 30% or less — breast, prostate, body of the uterus, testis, melanoma, cervix, Hodgkin's disease and thyroid, with male bladder on the borderline); those with a fairly good prognosis (a ratio greater than 30% but less than 50% — female oral and bladder, colorectal, non-Hodgkin's lymphoma, kidney, male oral and larynx); and those with a poor prognosis (ratio greater than 50% — lung, adult leukemia, pancreas, stomach, ovary, brain, multiple myeloma and esophagus).

Table 1
Estimated New Cases and Deaths for Cancer Sites and Gender, 2000

	New Cases 2000 Estimates			Deaths 2000 Estimates			Deaths/Cases Ratio 2000 Estimates		
	Total	M	F	Total	M	F	Total	M	F
All Cancers	**132,100**	**67,900**	**64,300**	**65,000**	**34,600**	**30,400**	**0.49**	**0.51**	**0.47**
Lung	20,600	12,200	8,400	17,700	10,700	7,000	0.86	0.88	0.83
Breast	19,200	–	19,200	5,500	–	5,500	0.28	–	0.28
Colorectal	17,000	9,200	7,900	6,500	3,500	3,000	0.38	0.38	0.39
Prostate[1]	16,900	16,900	–	4,200	4,200	–	0.25	0.25	–
Non-Hodgkin's Lymphoma	6,000	3,300	2,700	2,600	1,400	1,250	0.44	0.43	0.46
Bladder	4,800	3,600	1,250	1,500	1,000	450	0.31	0.29	0.36
Kidney	3,900	2,400	1,500	1,450	880	540	0.36	0.36	0.36
Melanoma	3,700	1,950	1,750	800	480	320	0.22	0.24	0.18
Body of Uterus	3,500	–	3,500	670	–	670	0.19	–	0.19
Leukemia	3,500	1,950	1,500	2,100	1,200	930	0.62	0.62	0.62
Oral	3,200	2,200	990	1,050	740	320	0.33	0.33	0.32
Pancreas	3,100	1,500	1,600	3,100	1,500	1,650	1.00	0.98	1.02[2]
Stomach	2,800	1,750	1,050	2,000	1,200	790	0.71	0.68	0.75
Ovary	2,500	–	2,500	1,500	–	1,500	0.60	–	0.60
Brain	2,300	1,300	1,050	1,550	880	670	0.66	0.67	0.65
Thyroid	2,100	500	1,600	170	55	110	0.08	0.11	0.07
Multiple Myeloma	1,700	940	750	1,250	660	570	0.73	0.70	0.76
Cervix	1,450	–	1,450	430	–	430	0.29	–	0.29
Esophagus	1,350	920	410	1,450	1,050	390	1.08[2]	1.14[2]	0.94
Larynx	1,250	1,050	230	530	430	95	0.41	0.41	0.41
Hodgkin's Disease	840	450	390	130	70	60	0.16	0.16	0.15
Testis	820	820	–	40	40	–	0.05	0.05	–
All Other Sites	9,500	4,900	4,600	8,800	4,600	4,200	0.93	0.94	0.92

– Not applicable

[1] The estimate of new prostate cases was based on data years 1980-1989. Please refer to Appendix I: Methods for further details.

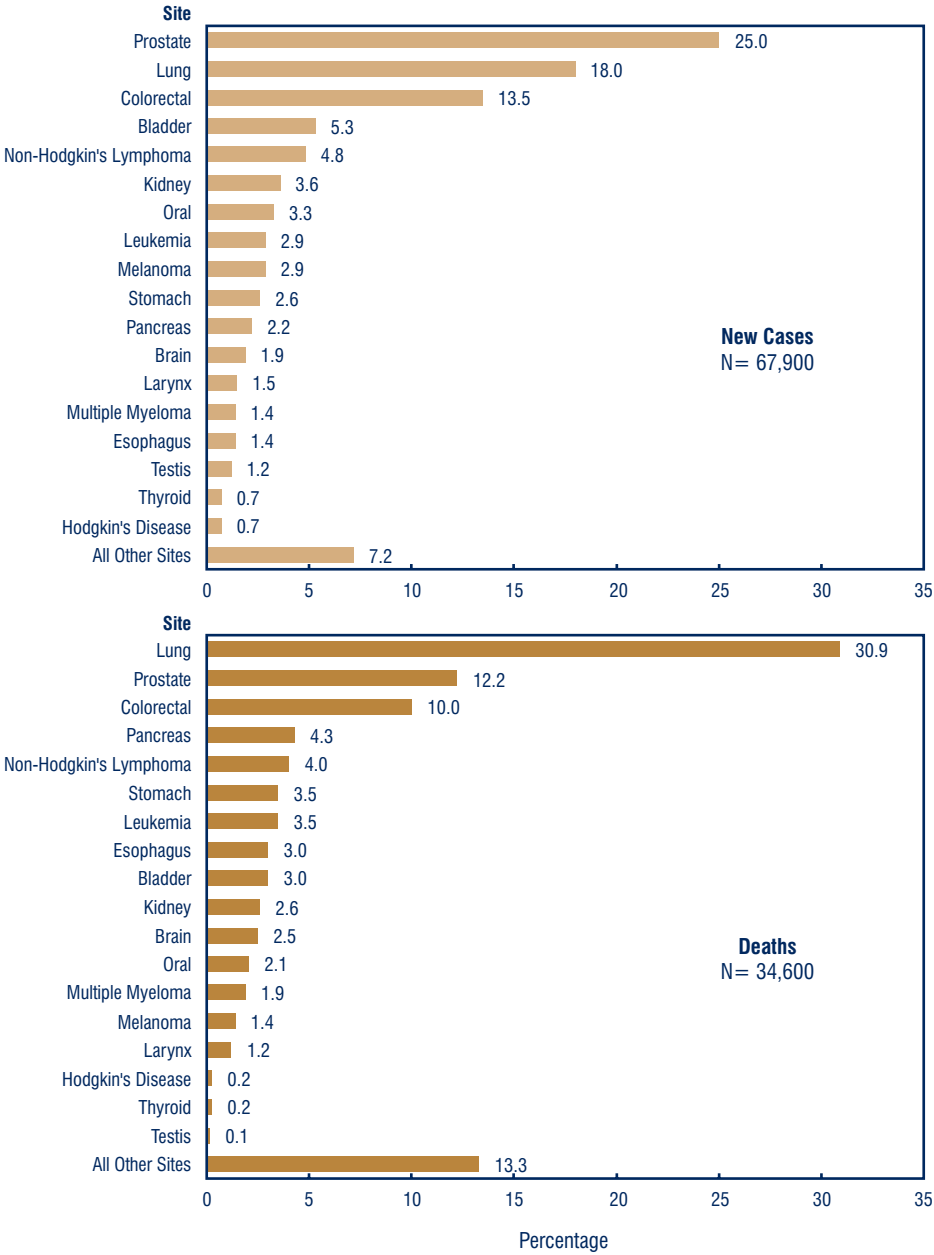
[2] The high ratio (in excess of 1.0) for cancers of esophagus and pancreas may result from incomplete registration of this cancer before death. Please refer to Appendix I: Methods for further details.

Note: Incidence figures exclude an estimated 68,000 new cases of non-melanoma skin cancer (ICD-9 173). Totals may not equal the sum of the parts due to rounding. Please refer to Appendix I: Methods for further details.

Source: Cancer Bureau, LCDC, Health Canada

Figure 1.1

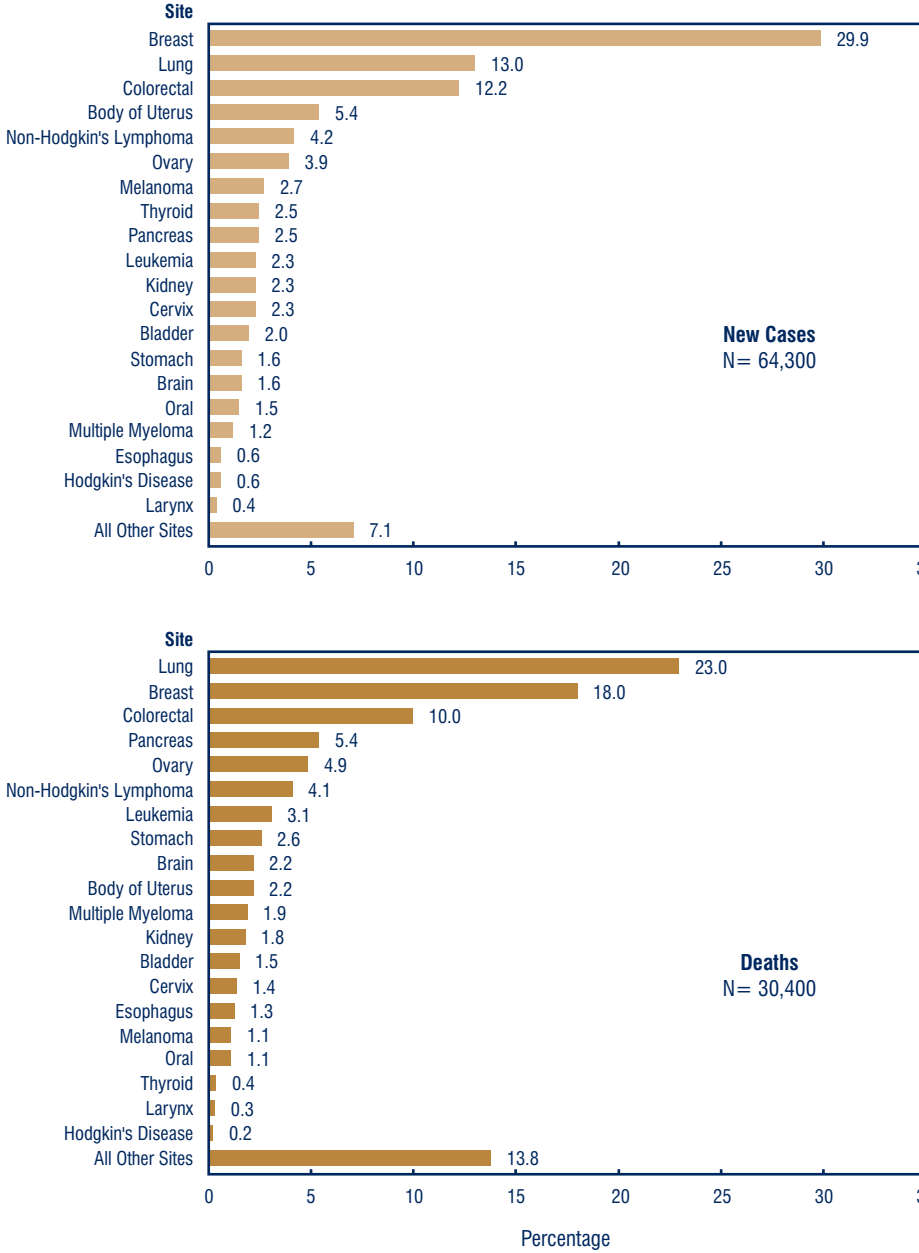
Percentage Distribution of Estimated New Cases and Deaths for Selected Cancer Sites, Males, 2000



Note: Incidence figures exclude an estimated 68,000 new cases of non-melanoma skin cancer (ICD-9 173).
Source: Cancer Bureau, LCDC, Health Canada

Figure 1.2

Percentage Distribution of Estimated New Cases and Deaths for Selected Cancer Sites, Females, 2000



Note: Incidence figures exclude an estimated 68,000 new cases of non-melanoma skin cancer (ICD-9 173).
Source: Cancer Bureau, LCDC, Health Canada

GEOGRAPHIC PATTERNS OF CANCER OCCURRENCE

Table 2 presents population projections and estimates of new cases and deaths for all cancer sites combined, by gender and province or territory for 2000. Tables 3 and 4 present estimates of the number of new cases and the age-standardized incidence rates for each of the major cancer sites, by gender and province for 2000. The age-standardized estimates take into consideration the differences in provincial age distributions, thus facilitating inter-provincial comparisons. Similarly, Tables 5 and 6 present estimates of the number of deaths and the age-standardized mortality rates for each of the major cancer sites, by gender and province for 2000. The calculation of standardized rates using the 1991 Canadian population as the standard is described in the *Glossary.* Adjustments were necessary for estimated incident cases in most provinces; however, these adjustments were not made in the age-standardized rates, which are modelled independently.

Data on provincial numbers and rates of incident cancer cases and cancer deaths provide valuable information for research, knowledge synthesis, planning and decision-making at the provincial level. These data are therefore of interest to researchers, health care workers, planners and policy-makers. Inevitably, these data will be used for interprovincial comparisons. While the incidence rates for some cancers appear to be consistent across jurisdictions (e.g. breast), the rates for others (e.g. prostate) appear to vary more widely. Interpretation of these variations must be done with caution, however, because a variety of reasons could account for these observations. First, if the cancer is rare, the number of cases occurring annually in a given province may be so small that rate estimates may be unreliable. Second, correlations found between the incidence of disease and the prevalence of risk factors for a given geographic location can be misleading. Proof of a causal association between a risk factor and a disease necessitates more detailed studies of individuals. However, different patterns of tobacco consumption among the provinces contribute to some of the variation. Third, for many cancers there is a long interval between exposure to a risk factor and the occurrence of disease, and often the information on the prevalence of risk factors from previous decades is inadequate. Lower socio-economic status has been associated with higher cancer mortality and with increased (cervical) or decreased incidence of certain cancers. Fourth, the availability of and the completeness in target populations of screening programs (e.g. breast, cervix) differ among provinces. As well, the availability of diagnostic procedures may differ regionally. Finally, there are differences in the reporting procedures used in cancer registration (e.g. registration of second primary breast cancers). Nevertheless, these comparisons may prove useful in some instances for generating hypotheses that lead to further epidemiologic studies, which may reveal true differences and causal associations with significant importance for cancer control planning.

Table 2

Estimated Population, New Cases and Deaths for All Cancers by Gender and Geographic Region, 2000

	Population (000s) 2000 Estimates[1]			New Cases 2000 Estimates[2]			Deaths 2000 Estimates[2]		
	Total	M	F	Total	M	F	Total	M	F
Canada	**31,265**	**15,476**	**15,789**	**132,100**	**67,900**	**64,300**	**65,000**	**34,600**	**30,400**
Newfoundland	549	274	276	2,100	1,100	970	1,200	700	500
Prince Edward Island	140	69	71	690	360	340	330	190	140
Nova Scotia	960	474	487	4,800	2,600	2,200	2,500	1,350	1,150
New Brunswick	764	378	386	3,600	1,950	1,700	1,800	970	810
Quebec	7,522	3,708	3,815	33,400	17,200	16,200	17,600	9,400	8,100
Ontario	11,866	5,863	6,003	49,900	25,200	24,700	23,700	12,500	11,200
Manitoba	1,162	576	586	5,300	2,800	2,600	2,600	1,350	1,250
Saskatchewan	1,036	514	522	4,500	2,400	2,100	2,300	1,250	1,050
Alberta	2,990	1,502	1,488	10,100	4,900	5,200	4,900	2,600	2,300
British Columbia	4,172	2,067	2,105	17,500	9,200	8,200	8,100	4,300	3,800
Yukon	33	17	16	100	60	45	45	25	20
Northwest Territories	43	22	21	100	45	55	50	25	25
Nunavut	27	14	13	55	30	25	35	20	15

[1] 2000 population projections were provided by the Census and Demographics Branch, Statistics Canada.
[2] Figures exclude non-melanoma skin cancer (ICD-9 173).
Note: Totals may not equal the sum of the parts due to rounding. Please refer to Appendix I: Methods.
Source: Cancer Bureau, LCDC, Health Canada

Table 3

Estimated New Cases for Major Cancer Sites by Gender and Geographic Region, 2000

	New Cases										
	Canada[1]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**67,900**	**1,100**	**360**	**2,600**	**1,950**	**17,200**	**25,200**	**2,800**	**2,400**	**4,900**	**9,200**
Prostate	16,900	280	110	810	560	3,300	6,400	710	650	1,100	2,900
Lung	12,200	150	65	440	380	4,000	4,200	450	340	830	1,350
Colorectal	9,200	220	45	310	240	2,300	3,500	380	310	700	1,150
Bladder	3,600	65	20	170	120	1,350	1,050	160	180	160	310
Non-Hodgkin's Lymphoma	3,300	35	20	100	80	860	1,250	130	95	250	440
Kidney	2,400	40	15	85	70	590	940	110	75	220	280
Oral	2,200	65	10	70	45	560	840	110	80	160	270
Melanoma	1,950	40	10	85	65	260	790	65	70	220	340
Leukemia	1,950	15	5	45	50	470	800	65	100	180	210
Stomach	1,750	55	10	60	55	460	640	75	55	140	220
Pancreas	1,500	10	10	40	45	440	530	60	50	130	200
Brain	1,300	20	5	40	30	370	490	45	40	110	170
Larynx	1,050	15	5	30	30	370	350	30	35	60	100
Multiple Myeloma	940	15	10	35	20	250	350	45	25	60	130
Females											
All Cancers	**64,300**	**970**	**340**	**2,200**	**1,700**	**16,200**	**24,700**	**2,600**	**2,100**	**5,200**	**8,200**
Breast	19,200	340	90	660	520	4,500	7,500	740	620	1,650	2,600
Lung	8,400	80	40	330	240	1,950	3,200	370	250	660	1,200
Colorectal	7,900	150	65	300	210	2,100	3,000	320	250	540	950
Body of Uterus	3,500	60	15	110	80	850	1,350	170	110	300	440
Non-Hodgkin's Lymphoma	2,700	40	10	85	75	680	1,050	120	85	210	320
Ovary	2,500	25	10	75	50	720	960	95	100	170	310
Melanoma	1,750	40	10	65	50	290	690	65	55	210	270
Pancreas	1,600	10	10	55	50	430	590	65	55	160	200
Thyroid	1,600	35	5	30	30	340	790	50	35	130	170
Kidney	1,500	25	10	55	55	370	560	65	60	130	160
Leukemia	1,500	20	5	40	35	380	620	60	70	120	150
Cervix	1,450	30	10	55	35	300	610	60	45	130	180
Bladder	1,250	20	5	75	45	480	370	55	55	60	110
Stomach	1,050	35	5	30	25	300	370	40	35	80	120
Brain	1,050	5	5	25	25	290	400	40	35	80	110
Oral	990	10	5	30	20	210	410	50	30	70	150
Multiple Myeloma	750	15	5	20	20	200	290	25	25	55	100

[1] Canada totals include provincial and territorial estimates

Note: Canadian totals may not add due to rounding. New prostate cancer cases were estimated based on data years 1980-1989. The Canada and provincial totals for all cancers exclude an estimated 68,000 cases of non-melanoma skin cancer (ICD-9 173). Due to changes and improvements in source data and in methodology (as described in Appendix I: Methods), caution is needed if the 2000 estimates are compared to previously published estimates. These estimates may vary from actual figures. Please contact provincial cancer registries for the most current actual data.

Source: Cancer Bureau, LCDC, Health Canada

Table 4

Estimated Age-Standardized Incidence Rates for Major Cancer Sites by Gender and Geographic Region, 2000

	Rate per 100,000										
	Canada[1]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**446**	**387**	**456**	**493**	**505**	**486**	**425**	**476**	**371**	**402**	**450**
Prostate	116	92	110	138	149	109	106	137	79	112	160
Lung	80	54	88	87	97	108	70	75	58	66	61
Colorectal	59	77	60	63	60	61	60	62	54	55	53
Bladder	22	20	24	35	30	36	17	26	29	9	14
Non-Hodgkin's Lymphoma	21	12	19	20	23	22	21	23	17	18	20
Kidney	16	14	21	16	19	15	16	21	12	16	13
Oral	14	20	8	13	10	14	14	18	13	12	12
Melanoma	12	10	17	16	16	6	13	14	12	14	15
Leukemia	12	5	9	8	13	13	14	11	14	13	10
Stomach	11	17	9	10	13	12	10	11	8	10	10
Pancreas	10	2	14	8	11	11	9	10	8	10	9
Brain	8	7	4	8	7	10	8	7	7	7	8
Larynx	6	6	8	6	7	9	6	4	3	4	4
Multiple Myeloma	6	4	10	7	5	7	6	7	4	4	6
Females											
All Cancers	**345**	**306**	**391**	**362**	**348**	**346**	**345**	**368**	**322**	**338**	**325**
Breast	106	100	108	109	107	102	105	114	98	105	102
Lung	47	24	48	54	47	51	43	50	38	43	46
Colorectal	39	46	65	46	41	41	39	41	35	34	35
Body of Uterus	18	19	16	19	14	18	19	24	17	20	18
Ovary	14	8	11	12	10	15	13	13	15	9	11
Non-Hodgkin's Lymphoma	14	12	15	13	19	14	15	16	12	14	13
Melanoma	9	10	14	11	10	6	10	11	9	13	11
Thyroid	9	9	6	5	9	8	12	8	7	8	7
Pancreas	8	3	6	8	11	8	8	8	6	10	7
Cervix	8	9	14	10	7	7	9	9	8	8	8
Kidney	8	7	10	9	11	7	8	9	9	9	7
Leukemia	8	5	6	6	7	8	9	8	10	8	6
Bladder	6	3	7	11	9	9	5	7	8	3	4
Brain	6	1	3	5	6	7	6	6	6	5	5
Oral	5	4	1	5	4	4	6	7	4	4	6
Stomach	5	11	3	4	4	5	5	4	4	5	4
Multiple Myeloma	4	3	3	3	4	4	4	3	3	3	4

[1] Canada totals include provincial and territorial estimates

Note: Rates for prostate cancer were estimated based on data years 1980-1989. Rates exclude non-melanoma skin cancer (ICD-9 173) and are adjusted to the age distribution of the 1991 Canadian population. Due to changes and improvements in source data and in methodology (as described in Appendix I: Methods), caution is needed if the 2000 estimates are compared to previously published estimates. These estimates may vary from actual figures.

Source: Cancer Bureau, LCDC, Health Canada

Table 5

Estimated Deaths for Major Cancer Sites by Gender and Geographic Region, 2000

	Deaths										
	Canada[1]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**34,600**	**700**	**190**	**1,350**	**970**	**9,400**	**12,500**	**1,350**	**1,250**	**2,600**	**4,300**
Lung	10,700	240	55	430	340	3,500	3,500	360	330	720	1,250
Prostate	4,200	80	30	170	110	900	1,600	180	240	390	540
Colorectal	3,500	60	15	100	65	1,100	1,250	130	130	240	360
Pancreas	1,500	20	10	55	45	390	540	50	55	120	200
Non-Hodgkin's Lymphoma	1,400	15	5	65	45	310	530	80	55	100	190
Stomach	1,200	45	5	45	30	370	410	45	40	70	140
Leukemia	1,200	10	5	30	25	290	490	50	50	100	150
Bladder	1,000	20	5	40	25	260	370	45	50	75	140
Brain	880	15	–	30	25	260	280	35	30	75	120
Kidney	880	25	5	35	30	230	290	55	30	70	110
Oral	740	15	5	30	20	220	250	30	20	50	90
Multiple Myeloma	660	10	5	30	20	170	240	30	25	45	90
Melanoma	480	5	–	25	10	85	220	20	15	40	60
Larynx	430	5	–	15	15	160	130	15	15	20	45
Females											
All Cancers	**30,400**	**500**	**140**	**1,150**	**810**	**8,100**	**11,200**	**1,250**	**1,050**	**2,300**	**3,800**
Lung	7,000	95	50	280	160	2,000	2,400	250	240	460	990
Breast	5,500	95	25	200	140	1,450	2,100	210	170	430	630
Colorectal	3,000	50	20	100	70	1,000	1,050	120	120	160	320
Pancreas	1,650	25	10	65	50	410	590	60	65	150	210
Ovary	1,500	30	5	50	30	360	560	65	60	120	210
Non-Hodgkin's Lymphoma	1,250	15	10	55	40	270	500	65	50	80	160
Leukemia	930	15	5	35	25	220	360	40	45	75	110
Stomach	790	30	5	25	20	250	250	30	30	60	90
Body of Uterus	670	10	5	30	20	190	250	30	15	50	70
Brain	670	5	5	25	15	210	220	25	20	55	90
Multiple Myeloma	570	15	–	20	10	150	210	25	20	55	60
Kidney	540	10	–	20	25	160	170	25	30	35	65
Bladder	450	10	–	20	15	110	160	25	15	35	65
Cervix	430	10	5	20	10	90	170	20	15	40	60
Oral	320	–	–	15	5	70	130	20	10	25	45
Melanoma	320	5	5	5	10	55	150	10	10	25	45

– Fewer than 5 cases

[1] Canada totals include provincial and territorial estimates

Note: Canadian totals may not add due to rounding. The Canada and provincial totals for all cancers exclude non-melanoma skin cancer (ICD-9 173). Due to changes and improvements in source data and in methodology (as described in Appendix I: Methods), caution is needed if the 2000 estimates are compared to previously published estimates.These estimates may vary from actual figures.

Source: Cancer Bureau, LCDC, Health Canada

Table 6

Estimated Age-Standardized Mortality Rates for Major Cancer Sites by Gender and Geographic Region, 2000

	Rate per 100,000										
	Canada[1]	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**229**	**264**	**263**	**270**	**253**	**263**	**218**	**219**	**213**	**206**	**200**
Lung	70	88	76	87	89	95	59	60	56	58	57
Prostate	30	32	40	35	32	28	30	29	38	33	26
Colorectal	23	23	19	20	17	31	22	22	22	19	17
Pancreas	10	7	11	11	11	11	9	8	8	9	9
Non-Hodgkin's Lymphoma	9	5	9	12	11	8	9	12	9	8	8
Stomach	8	17	10	9	6	10	7	6	6	5	6
Leukemia	8	5	7	6	6	8	9	8	8	8	7
Bladder	7	8	6	9	6	8	7	7	7	6	7
Kidney	6	8	7	7	8	6	5	9	4	5	5
Oral	5	5	6	6	4	6	4	5	3	4	4
Brain	5	4	4	6	5	7	5	6	6	5	5
Multiple Myeloma	4	4	7	6	5	5	4	5	4	3	4
Larynx	3	3	3	3	3	4	2	2	2	2	2
Melanoma	3	1	3	4	3	2	4	3	3	3	3
Females											
All Cancers	**151**	**154**	**150**	**175**	**158**	**160**	**147**	**159**	**141**	**147**	**141**
Lung	36	27	50	43	38	40	33	40	34	35	37
Breast	27	29	21	29	27	29	27	28	23	27	23
Colorectal	14	14	15	14	12	19	13	14	10	9	11
Pancreas	8	7	10	9	10	8	8	7	8	9	8
Ovary	8	8	4	8	7	7	8	9	8	8	8
Non-Hodgkin's Lymphoma	6	4	6	8	8	5	7	8	7	5	6
Stomach	4	8	1	3	3	5	3	3	3	3	3
Brain	4	2	2	3	4	4	3	3	3	4	4
Leukemia	4	5	2	5	4	4	5	5	6	5	4
Body of Uterus	3	2	3	4	4	4	3	4	2	3	3
Multiple Myeloma	3	4	–	3	2	3	3	2	3	3	2
Kidney	3	2	1	3	4	3	2	3	3	2	2
Oral	2	–	1	2	–	1	2	2	1	2	2
Melanoma	2	1	2	1	1	1	2	2	1	2	2
Cervix	2	3	3	3	1	2	2	2	1	3	2
Bladder	2	2	–	1	2	2	2	3	2	2	2

– Estimated age-standardized incidence rate is less than 0.5 per 100,000

[1] Canada totals include provincial and territorial estimates

Note: Rates are adjusted to the age distribution of the 1991 Canadian population. Due to changes and improvements in source data and in methodology (as described in Appendix I: Methods), caution is needed if the 2000 estimates are compared to previously published estimates. These estimates may vary from actual figures.

Source: Cancer Bureau, LCDC, Health Canada

Recent trends in incidence and mortality for major types of cancer are assessed by comparing annual age-standardized rates. Figures 2.1 and 2.2 present the number of new cases and deaths for Canadian men and women together with the corresponding age-standardized rates from 1971-1995 and 1971-1997 respectively, with estimates to the year 2000. Figures 2.3 and 2.4 depict the relative contribution to the change in the total number of new cases and deaths that can be attributed to changes in cancer rates, population size and the aging of the population. Detailed depictions of the trends in annual rates for selected sites since 1971 are presented in Figures 3 and 4, with the data points provided in Tables 7 and 8. The average annual percent changes in site-specific incidence and mortality rates since 1988 are listed in Table 9 and plotted in Figure 5.

The process of age standardization permits comparisons between calendar years, since it accounts for changes that have occurred over time in the age distribution of the population. Rates in this publication have been standardized to the 1991 Canadian population and cannot be compared directly with those in editions prior to 1995. Note also that the rapid increase in incidence rates throughout the 1970s displayed in Figure 2 largely reflects improved registration of new cases in several provincial registries during this period. Registration levels, however, have generally stabilized since 1981 because of increasing consistency of cancer reporting procedures across Canada.[1]

All Sites

Among men, the cancer mortality rate, after reaching a peak in 1988 (Figure 2.2, Table 7.2), is declining slowly as a result of decreases in mortality rates for lung, colorectal and other cancers. In contrast, the cancer incidence rate rose slightly in the early 1990s because of the sharp increase in incidence of prostate cancer and more recently has begun to level off or decline slightly. Among women, cancer incidence has risen slightly since 1989, and mortality rates have remained relatively stable since 1985 (Figures 2.1 and 2.2, Table 8).

Figures 2.1 and 2.2 show that despite the relative stability in the age-standardized rates, the numbers of new cases and deaths continue to rise steadily as the Canadian population ages. The numbers of new cases and deaths, as opposed to rates, are an important measure of the cancer burden on the Canadian population and health care system. In 2000, the number of new cases is estimated to be 132,100 and the number of new deaths to be 65,000. These numbers can be used to plan patient services and health care facilities to meet the increasing demand.

Figures 2.3 and 2.4 show how changes since 1971 in the total population and in the age structure of the population have affected trends in the total number of cases and deaths. The lowest plot in these graphs represents the total number of cases (or deaths) that would have occurred each year if only the rates had changed but the population had remained the same as in 1971. The middle line represents the number of cases (or deaths) that would have occurred each year if the annual rates had acted upon a population that grew larger but maintained the same age distribution as in 1971. The top line represents the number of cases (or deaths) that actually occurred and thus reflects the combined impact of rate change, population growth and the aging of the population. These figures demonstrate that changes in the population size and age structure have been the major determinants of the increasing burden of cancer among Canadians. An important implication is that as the Canadian population continues to age and grow in size, there will be a concordant increase in the number of new cases and deaths each year.

TRENDS IN INCIDENCE AND MORTALITY

Figure 6 plots an index of age-standardized mortality rates since 1971 for all sites combined and for all sites excluding lung cancer. Among men, lung cancer was responsible for the increase in cancer mortality rates until overall rates peaked in 1988. Since then, overall cancer mortality rates among men declined by similar percentages, whether or not lung cancer rates were included. Among women, the index shows that overall cancer mortality rates remained essentially stable between 1971 and 1997. However, cancer mortality for all sites other than lung cancer has dropped by 17% since 1971.

Trends by Selected Sites

Time trends of incidence and mortality rates since 1970 for selected cancer sites are shown for men in Figures 3.1 and 3.2 and for women in Figures 4.1 and 4.2, with the corresponding data points tabulated in Tables 7.1, 7.2, 8.1 and 8.2. Average annual percent changes for the set of cancer sites examined in this publication are summarized in Table 9 and Figure 5. In general, incidence and mortality rates for the majority of cancer sites have stabilized or declined during the past decade, with some notable exceptions.

Among women, lung cancer incidence and mortality rates continue their rapid increase and are now almost five times as high as rates in 1971. However, estimated rates for lung cancer incidence and mortality among women in 2000 are still much lower than those for men. Among men, lung cancer rates levelled off in the mid-1980s and have since consistently declined, reflecting men's drop in tobacco consumption beginning in the mid-1960s. Among women, however, smoking rates declined only slightly in the past three decades, and lung cancer rates among women continue to increase.[5]

After years of steady increases, incidence rates of prostate cancer rose particularly sharply from 1989 to 1993. By contrast, mortality rates have risen much more slowly since 1978, and appear to have stabilized in the early 1990s. Increased incidence of prostate cancer prior to 1990 is at least partly due to increased detection of cancers following trans-urethral resection of the prostate (TURP) for suspected benign prostatic hypertrophy.[6] The sharp increase since 1990 is predominantly the result of increased early detection using PSA (determination of the Prostate Specific Antigen level).[7] This rate is now starting to show a decline (expected on theoretical grounds and illustrated by the experience to date in the United States[8]), probably because early detection has now exhausted the pool of prevalent cancers in the population. Despite the sharp increase in incidence it is especially relevant to note that, at this time, there has not been any substantial associated change in mortality rates, i.e. the increase in incidence has not had a significant impact on mortality in either a positive or a negative direction. Other methods of early detection that have been considered include digital rectal examination and transrectal ultrasonography.[9] Although much of the past increase in incidence is likely due to early detection, changes in risk or protective factors might also account for some of the increases. However, no such risk or protective factors have yet been identified that could explain these changes.[7] To reflect these patterns, a conservative estimate for prostate cancer incidence was derived from rates in an earlier period (see *Appendix I: Methods*).

Breast cancer incidence among women also rose steadily, but gradually, over the past decade; this increase may be due, in part, to the rising number of mammographic examinations since the mid-1980s, but may also be affected by reproductive histories. However, while incidence is rising, mortality rates for breast cancer have declined

steadily since 1986 and particularly since 1990. The most recent actual data for 1997 showed the breast cancer mortality rate to be at its lowest since 1950.[10] Similar declines are also occurring in the United States, the United Kingdom, and Australia.[10] Further research is needed to determine whether early detection through screening, improved treatment, or changes in risk or protective factors are responsible for this decline.

Of all of the cancers analyzed in this report, the incidence of just two cancers among men and two among women has increased at an average rate greater than 2% annually since 1988 (Table 9). These were cancers of the prostate (+5.1%) and thyroid (+3.5%) in men, and lung (+2.5%) and thyroid cancer (+6.3%) in women. The increasing rate of thyroid cancer has also been noted in Europe and parts of the U.S. It is postulated that improved early detection practices and technologies (ultrasound and needle biopsy) are identifying early stage cancers more frequently than was possible in the past. As modern treatment achieves normal survival in the majority of patients it is unlikely that the mortality rate will increase. The only other cancer showing a significant increase, but of less than 2%, was non-Hodgkin's lymphoma in both men and women.

Lung cancer mortality among women increased at +2.5% per year and was the only cause of cancer death for which the average annual percent change exceeded 2.0%. In both men and women, melanoma (+1.6% and +1.8%) and non-Hodgkin's lymphoma (+1.1% and +1.3%) showed a statistically significant increase in mortality.

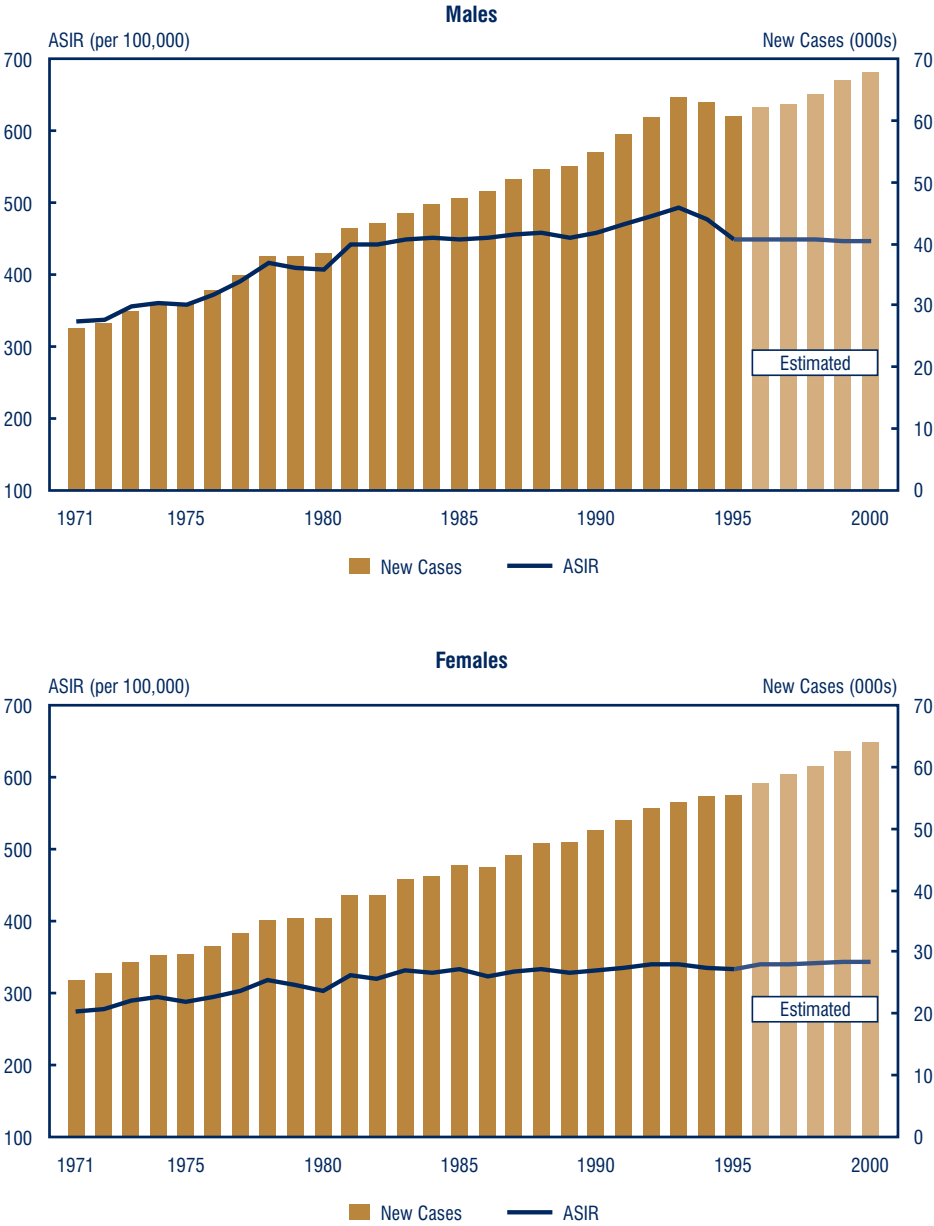
Rates for other cancer sites generally declined. Incidence and mortality rates for colorectal cancer continued to decrease, particularly among women, although the reasons are not completely understood. Some evidence suggests that lifestyle changes such as diet may have contributed to the declines. In addition, consensus is emerging internationally about the benefits of population-based screening for colorectal cancer. This is under consideration in Canada at both provincial and national levels. However, casual screening is already prevalent in Canada and may have contributed to the reduction in mortality rates. This can best be evaluated by the establishment and evaluation of organized screening programs.

Rates of bladder cancer have declined since 1987 for both men and women by about 2% per year for incidence and by over 1% per year for mortality. Part of the decline in incidence can be attributed to changing reporting procedures among registries in Canada.[1] However, the fact that mortality is also declining, but at a slower pace, may indicate improved survival and/or possibly a true decline in incidence.

Mortality rates have dropped dramatically for testicular cancer (-3.7%) and Hodgkin's disease (-5.0% for both men and women) as a result of improved treatment methods. The lower mortality has occurred despite stable or increasing incidence rates, indicating improved survival. Continuing large declines in incidence and mortality for stomach cancer (men -3.6%, women -2.8%) may reflect improved diets, while lower rates of invasive cervical cancer (-1.5% incidence and -2.3% mortality) may reflect the impact of early detection through Pap smear screening programs. Smaller but statistically significant declines in incidence also occurred for leukemia, oral cancer and cancer of the pancreas in men. Likewise, small but statistically significant declines in mortality rates have occurred in oral cancers; cancer of the pancreas and larynx in men; and brain cancer and leukemia in women.

Figure 2.1

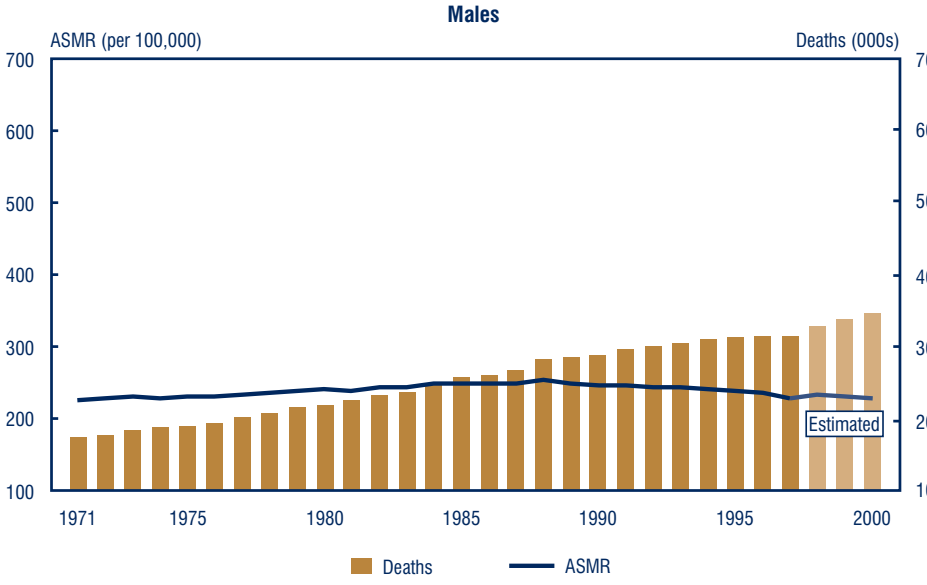
New Cases and Age-Standardized Incidence Rates (ASIR) for All Cancers, 1971-2000

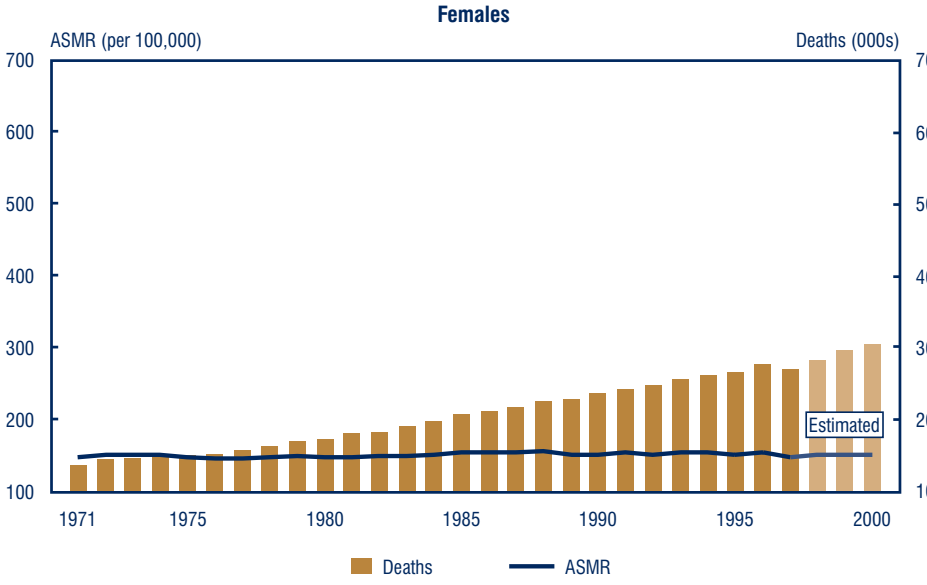


Note: All cancers exclude non-melanoma skin cancer (ICD-9 173). Rates are standardized to the 1991 Canadian population.

Source: Cancer Bureau, LCDC, Health Canada

Figure 2.2
Deaths and Age-Standardized Mortality Rates (ASMR) for All Cancers, 1971-2000

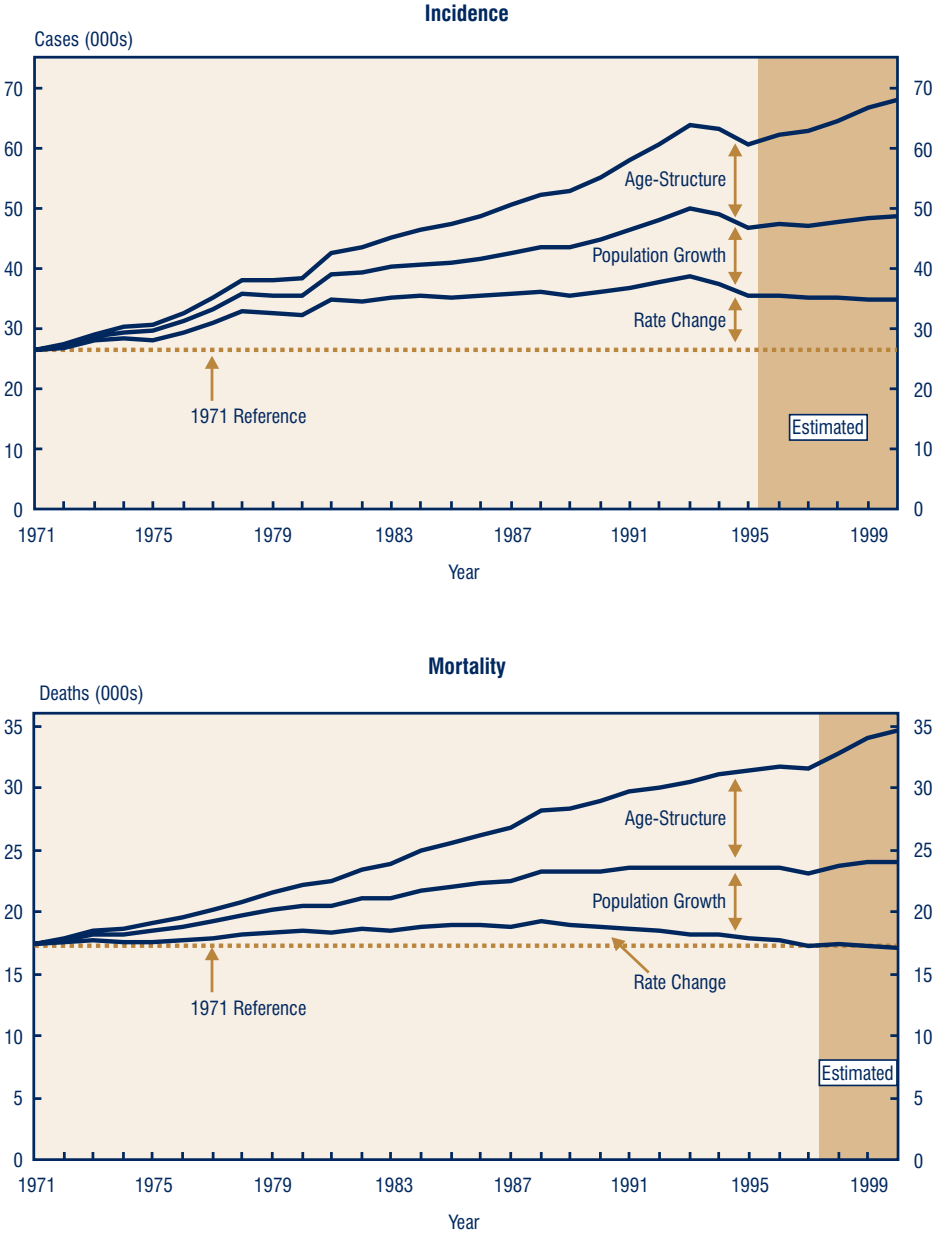




Note: Rates are standardized to the 1991 Canadian population.
Source: Cancer Bureau, LCDC, Health Canada

Figure 2.3

Trends in New Cases and Deaths Attributed to Cancer Rate, Population Growth, and Population Age-Structure, All Cancers, All Ages, Males, 1971-2000

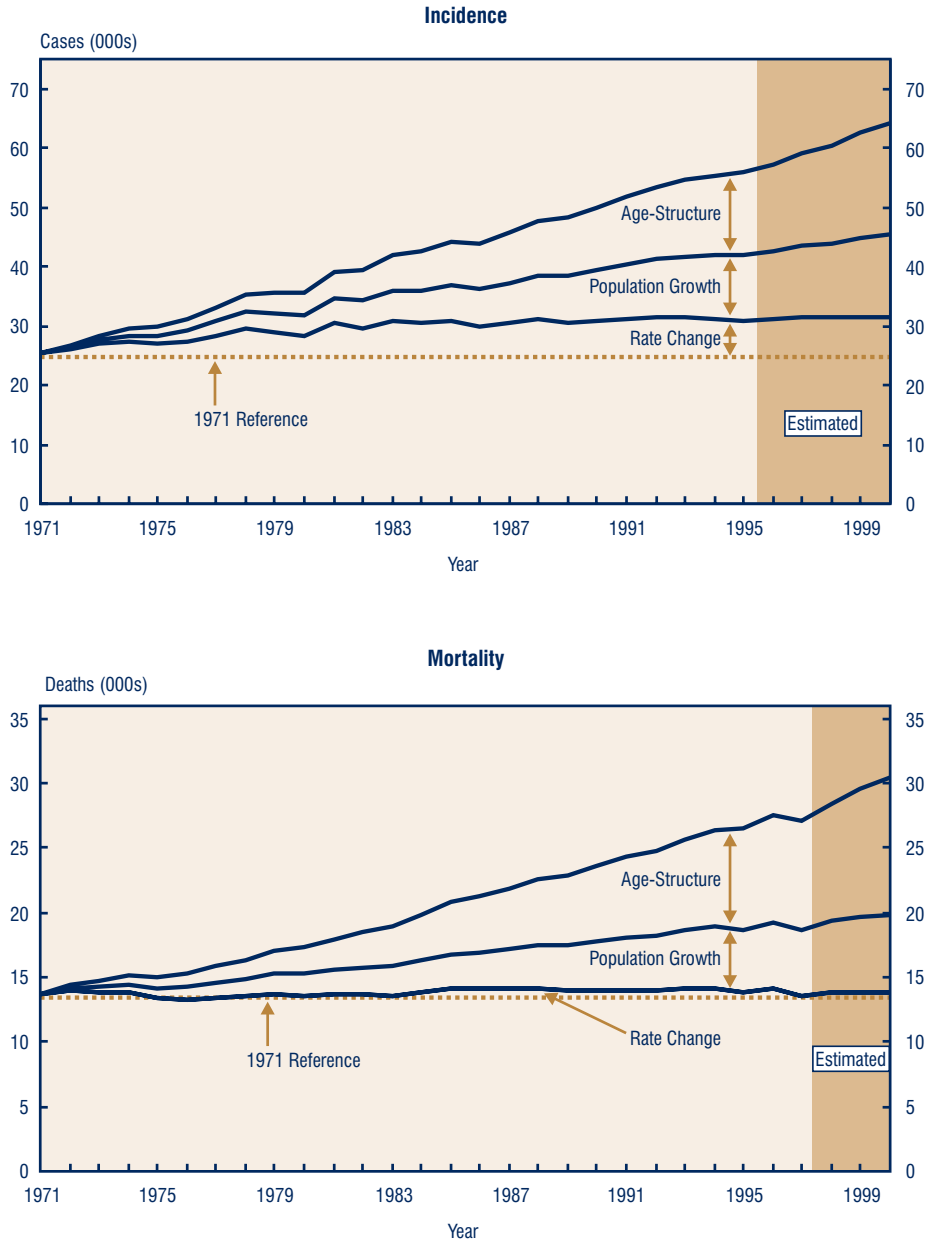


Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Magnitude of area represents the number of cases/deaths due to each change. Please refer to Appendix I: Methods for futher details.

Source: Cancer Bureau, LCDC, Health Canada

Figure 2.4

Trends in New Cases and Deaths Attributed to Cancer Rate, Population Growth and Population Age-Structure, All Cancers, All Ages, Females, 1971-2000

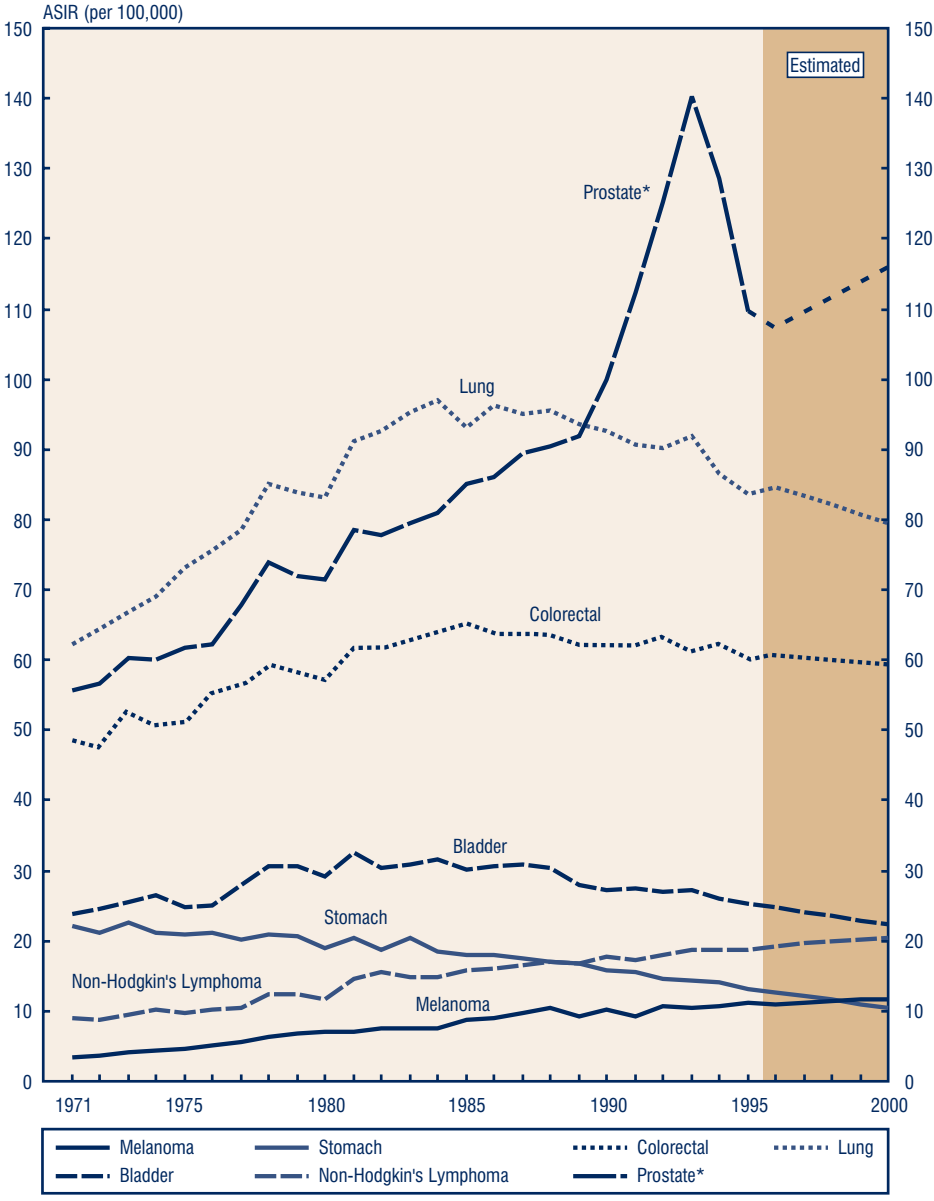


Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Magnitude of area represents the number of cases/deaths due to each change. Please refer to Appendix I: Methods for futher details.

Source: Cancer Bureau, LCDC, Health Canada

Figure 3.1

Age-Standardized Incidence Rates (ASIR) for Selected Cancer Sites, Males, 1971-2000



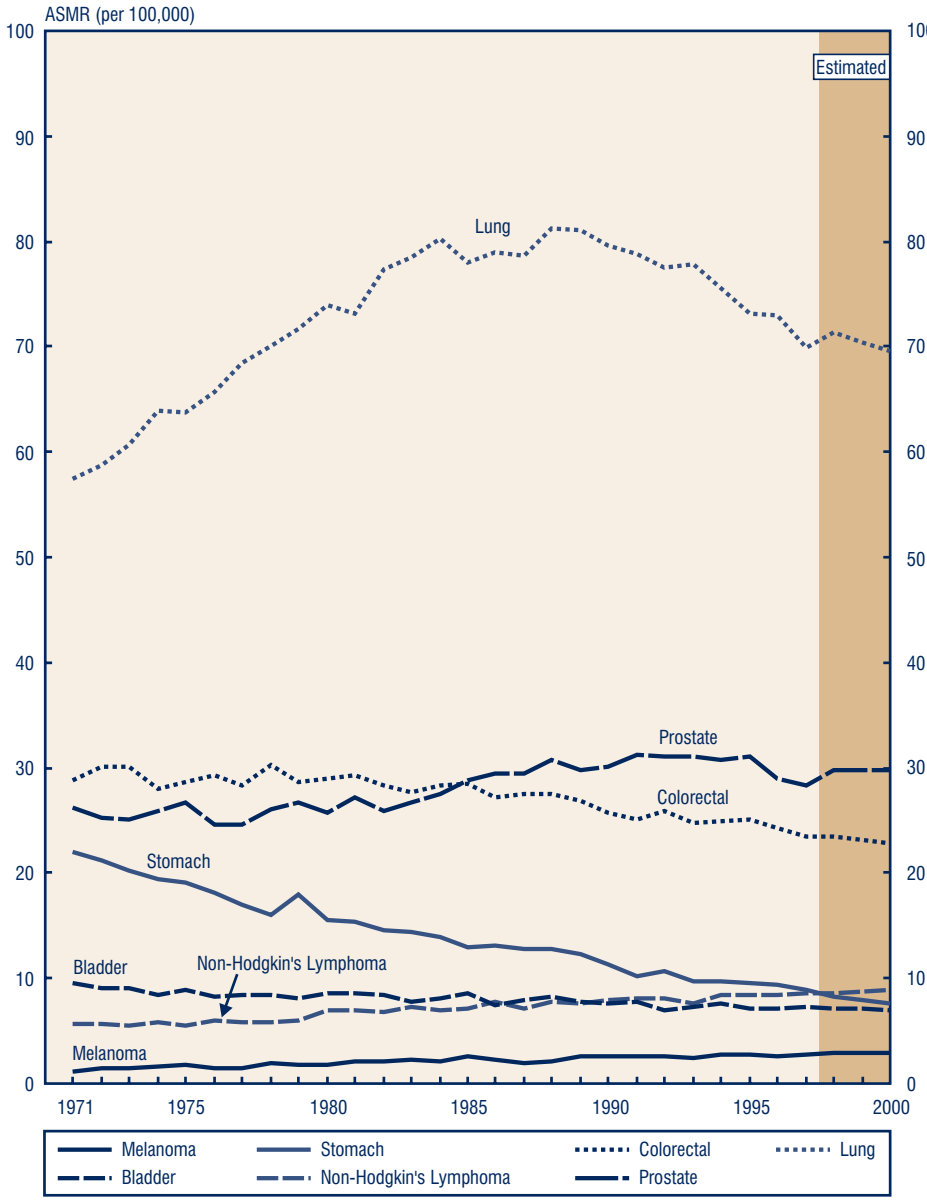
* The rate for postate cancer is based on data from 1980 to 1989. Please refer to Appendix I: Methods for futher details.

Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 7.1 for data points.

Source: Cancer Bureau, LCDC, Health Canada

Figure 3.2

Age-Standardized Mortality Rates (ASMR) for Selected Cancer Sites, Males, 1971-2000

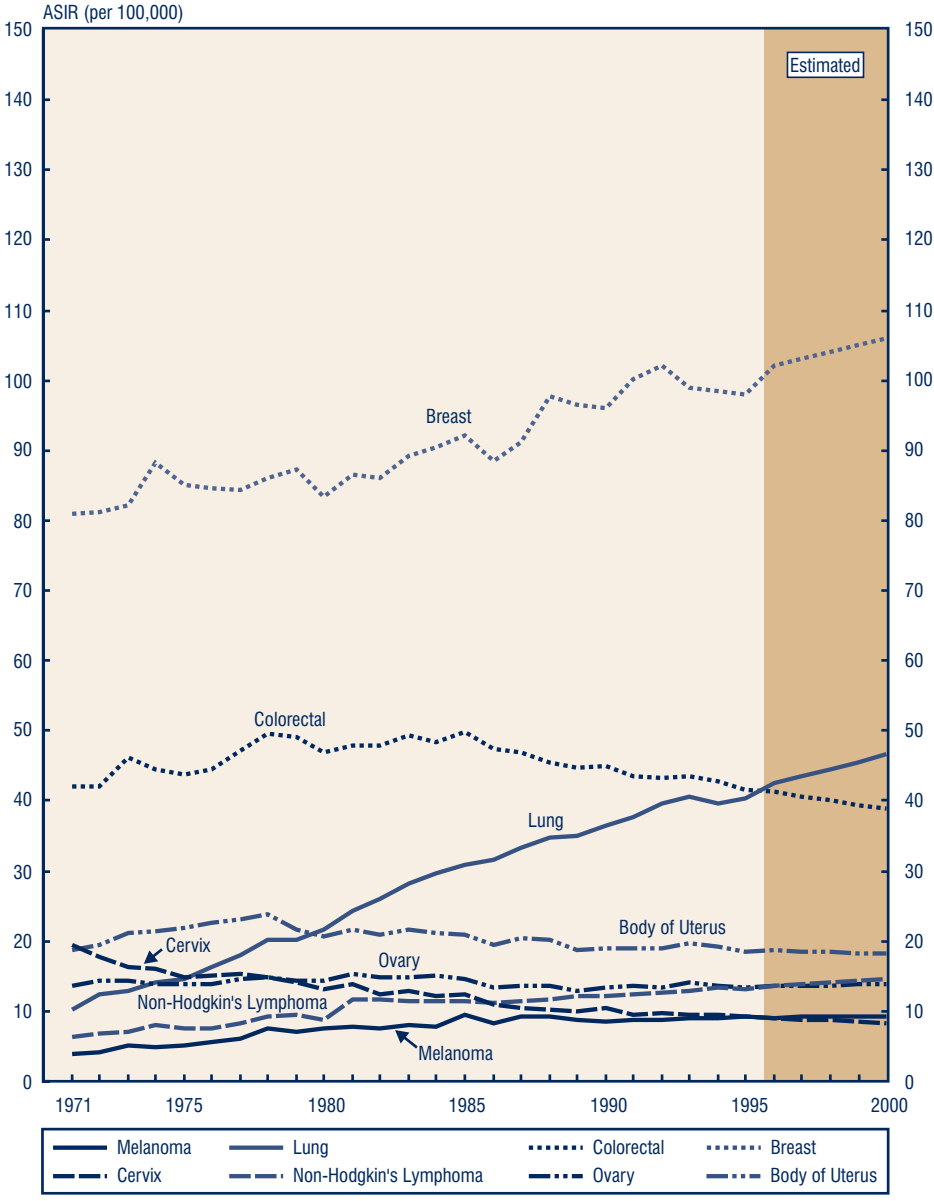


Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 7.2 for data points.

Source: Cancer Bureau, LCDC, Health Canada

Figure 4.1

Age-Standardized Incidence Rates (ASIR) for Selected Cancer Sites, Females, 1971-2000

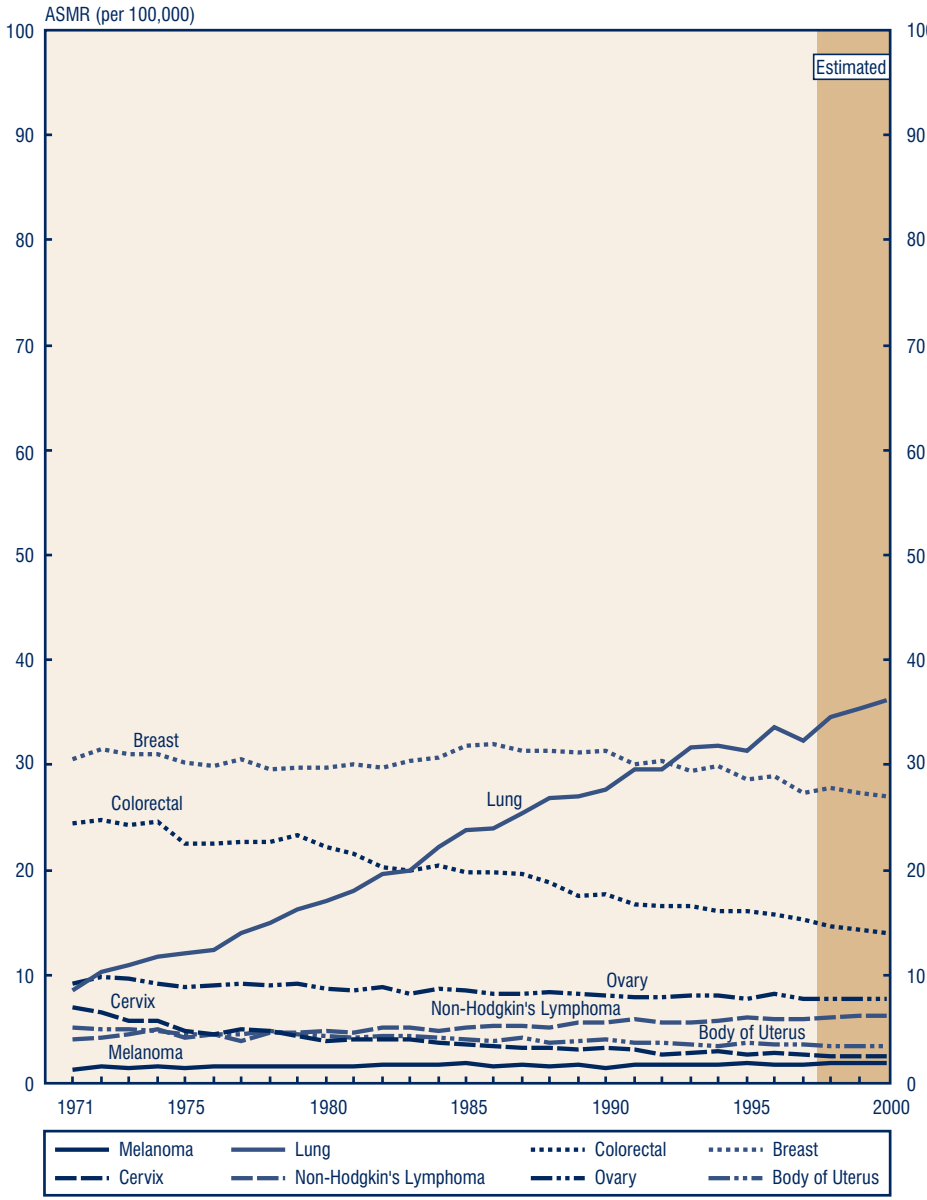


Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.1 for data points.

Source: Cancer Bureau, LCDC, Health Canada

Figure 4.2

Age-Standardized Mortality Rates (ASMR) for Selected Cancer Sites, Females, 1971-2000



Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.2 for data points.

Source: Cancer Bureau, LCDC, Health Canada

Table 7.1

Age-Standardized Incidence Rates for Selected Cancer Sites, Males, 1971-2000

Year	Rate per 100,000							
	All Cancers	Prostate	Lung	Colorectal	Bladder	Non-Hodgkin's Lymphoma	Melanoma	Stomach
1971	334.7	55.8	62.1	48.5	23.9	9.0	3.5	22.1
1972	338.3	56.7	64.5	47.8	24.5	8.6	3.5	21.1
1973	355.8	60.4	66.9	52.6	25.6	9.5	4.1	22.5
1974	359.8	60.0	69.0	50.8	26.4	10.1	4.5	21.1
1975	357.7	61.7	73.1	51.2	24.8	9.7	4.7	21.0
1976	371.9	62.1	75.7	55.3	25.1	10.1	5.1	21.2
1977	391.4	67.9	78.6	56.4	28.0	10.5	5.5	20.1
1978	417.2	74.0	85.1	59.4	30.6	12.5	6.4	20.9
1979	409.8	72.0	83.9	58.5	30.6	12.4	6.8	20.8
1980	406.1	71.4	83.2	57.3	29.2	11.6	7.0	19.0
1981	442.1	78.5	91.2	61.6	32.5	14.7	7.0	20.5
1982	440.7	77.8	92.6	61.9	30.3	15.6	7.5	18.7
1983	448.4	79.6	95.2	63.0	30.8	14.9	7.6	20.4
1984	450.0	80.9	97.1	64.0	31.7	14.9	7.5	18.4
1985	449.8	85.0	93.2	65.4	30.2	15.7	8.7	18.0
1986	451.9	86.1	96.4	63.8	30.6	16.0	9.0	18.0
1987	456.3	89.5	95.0	64.0	30.8	16.6	9.6	17.4
1988	458.4	90.4	95.5	63.7	30.3	17.0	10.4	17.0
1989	451.5	91.8	93.6	62.1	27.9	16.7	9.3	16.8
1990	457.6	99.8	92.7	62.2	27.2	17.7	10.1	15.8
1991	469.0	112.3	90.7	62.3	27.5	17.4	9.1	15.6
1992	480.3	125.2	90.2	63.4	27.1	17.9	10.6	14.5
1993	493.7	140.2	91.8	61.2	27.3	18.8	10.4	14.2
1994	476.1	128.6	86.7	62.3	26.0	18.7	10.7	14.0
1995	449.6	109.7	83.6	60.3	25.2	18.7	11.3	13.1
1996*	449.1	..	84.6	60.8	24.7	19.3	11.0	12.7
1997*	448.4	..	83.4	60.4	24.1	19.6	11.2	12.1
1998*	447.8	..	82.1	60.1	23.5	19.9	11.4	11.6
1999*	447.1	..	80.8	59.8	22.9	20.2	11.6	11.0
2000*	446.4	116.0	79.6	59.5	22.3	20.5	11.8	10.5

.. Estimates not provided. Please refer to Appendix I: Methods for further details.

* Estimated rates

Note: The rate for prostate cancer was estimated based on data years 1980-1989. Please refer to Appendix I: Methods for further details. Rates exclude non-melanoma skin cancer (ICD-9 173) and are standardized to the age distribution of the 1991 Canadian population.

Source: Cancer Bureau, LCDC, Health Canada

Table 7.2

Age-Standardized Mortality Rates for Selected Cancer Sites, Males, 1971-2000

Year	Rate per 100,000							
	All Cancers	Lung	Prostate	Colorectal	Non-Hodgkin's Lymphoma	Stomach	Bladder	Melanoma
1971	225.8	57.4	26.1	28.8	5.7	22.0	9.5	1.2
1972	228.2	58.7	25.2	30.1	5.6	21.2	9.1	1.4
1973	230.6	60.7	25.0	30.2	5.6	20.2	9.0	1.5
1974	229.2	63.9	25.9	28.0	5.9	19.4	8.5	1.6
1975	230.4	63.7	26.8	28.7	5.6	19.1	8.8	1.7
1976	230.2	65.8	24.7	29.3	6.0	18.2	8.3	1.5
1977	233.5	68.5	24.6	28.2	5.9	17.0	8.4	1.5
1978	236.3	70.1	26.1	30.2	5.9	16.1	8.4	1.9
1979	239.3	71.7	26.7	28.6	5.9	18.0	8.1	1.7
1980	240.7	74.0	25.7	28.9	7.0	15.5	8.6	1.7
1981	239.2	73.2	27.1	29.2	6.9	15.3	8.6	2.1
1982	243.5	77.4	26.0	28.2	6.8	14.6	8.4	2.1
1983	242.9	78.4	26.7	27.7	7.2	14.3	7.8	2.3
1984	247.8	80.2	27.4	28.3	7.0	13.9	8.1	2.1
1985	249.0	78.0	28.9	28.6	7.1	13.0	8.6	2.6
1986	249.0	79.0	29.4	27.2	7.7	13.1	7.4	2.3
1987	248.2	78.6	29.4	27.5	7.1	12.9	7.9	2.0
1988	254.7	81.3	30.7	27.6	7.8	12.8	8.3	2.2
1989	249.5	81.1	29.7	26.8	7.7	12.3	7.8	2.6
1990	246.4	79.5	30.1	25.7	7.9	11.3	7.5	2.6
1991	247.2	78.8	31.2	25.1	8.1	10.3	7.7	2.6
1992	244.6	77.5	31.0	25.9	8.1	10.7	6.9	2.6
1993	242.6	77.9	31.0	24.7	7.7	9.7	7.4	2.4
1994	241.6	75.5	30.7	25.0	8.4	9.7	7.6	2.7
1995	238.7	73.2	31.0	25.1	8.4	9.6	7.2	2.8
1996	236.2	72.9	29.0	24.3	8.4	9.4	7.2	2.6
1997	229.4	69.8	28.3	23.5	8.6	8.9	7.3	2.8
1998*	232.5	71.3	29.8	23.5	8.6	8.3	7.1	2.8
1999*	230.7	70.4	29.8	23.1	8.7	7.9	7.1	2.9
2000*	228.9	69.5	29.7	22.8	8.8	7.5	7.0	3.0

* Estimated rates

Note: Rates are standardized to the age distribution of the 1991 Canadian population.

Source: Cancer Bureau, LCDC, Health Canada

Table 8.1

Age-Standardized Incidence Rates for Selected Cancer Sites, Females, 1971-2000

Year	Rate per 100,000									
	All Cancers	Breast	Lung	Colorectal	Body of Uterus	Non-Hodgkin's Lymphoma	Ovary	Melanoma	Cervix	Stomach
1971	276.0	81.0	10.2	42.1	18.6	6.2	13.6	4.0	19.4	11.2
1972	280.2	81.2	12.5	42.0	19.5	6.9	14.3	4.1	17.8	10.1
1973	291.6	82.2	12.9	46.2	21.2	7.2	14.4	5.2	16.3	10.6
1974	294.9	88.2	14.0	44.4	21.5	8.1	13.8	5.0	16.1	9.9
1975	290.2	85.1	14.7	43.7	21.8	7.5	13.7	5.1	14.9	10.4
1976	294.9	84.6	16.3	44.6	22.7	7.5	13.9	5.6	15.2	9.3
1977	306.0	84.4	17.9	47.2	23.0	8.3	14.5	6.1	15.4	9.3
1978	319.3	86.1	20.1	49.5	23.9	9.2	14.9	7.6	14.7	9.5
1979	313.8	87.3	20.3	49.1	21.7	9.6	14.5	7.1	14.2	9.2
1980	305.5	83.3	21.7	46.8	20.8	8.8	14.4	7.5	13.0	8.6
1981	328.1	86.5	24.3	47.8	21.6	11.6	15.4	7.8	13.9	9.8
1982	321.0	86.0	25.9	48.0	21.0	11.7	14.7	7.5	12.3	8.7
1983	332.8	89.3	28.3	49.4	21.6	11.5	14.9	8.0	12.9	8.7
1984	329.5	90.3	29.6	48.3	21.2	11.3	15.0	7.7	12.2	8.1
1985	335.5	92.2	30.9	49.8	20.8	11.4	14.6	9.5	12.3	8.0
1986	324.9	88.6	31.6	47.4	19.5	11.3	13.3	8.3	10.9	8.3
1987	330.7	91.1	33.2	46.9	20.5	11.5	13.7	9.3	10.4	8.0
1988	336.0	97.8	34.8	45.4	20.1	11.7	13.6	9.2	10.2	7.2
1989	330.0	96.4	35.0	44.7	18.7	12.2	13.0	8.6	10.0	7.2
1990	333.2	96.0	36.5	45.0	19.0	12.1	13.4	8.5	10.4	6.9
1991	337.1	100.1	37.7	43.5	18.9	12.4	13.6	8.8	9.6	6.4
1992	341.2	102.1	39.6	43.4	18.9	12.7	13.5	8.7	9.6	6.5
1993	340.4	99.0	40.6	43.5	19.7	12.9	14.1	9.0	9.6	6.3
1994	337.9	98.6	39.6	42.8	19.3	13.3	13.6	9.1	9.4	6.3
1995	334.3	98.1	40.4	41.5	18.5	13.1	13.4	9.3	9.2	5.9
1996*	340.8	102.1	42.5	41.2	18.7	13.6	13.7	9.1	9.0	5.6
1997*	342.0	103.1	43.5	40.6	18.5	13.8	13.7	9.1	8.9	5.4
1998*	343.1	104.1	44.5	40.1	18.4	14.0	13.7	9.2	8.7	5.1
1999*	344.3	105.0	45.6	39.5	18.3	14.2	13.7	9.2	8.5	4.9
2000*	345.4	106.0	46.6	38.9	18.2	14.5	13.8	9.3	8.4	4.7

* Estimated rates

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are standardized to the age distribution of the 1991 Canadian population.

Source: Cancer Bureau, LCDC, Health Canada

Table 8.2

Age-Standardized Mortality Rates for Selected Cancer Sites, Females, 1971-2000

Year	Rate per 100,000									
	All Cancers	Lung	Breast	Colorectal	Ovary	Non-Hodgkin's Lymphoma	Stomach	Body of Uterus	Cervix	Melanoma
1971	149.0	8.6	30.6	24.4	9.2	3.9	10.8	5.1	6.9	1.0
1972	152.9	10.2	31.4	24.8	9.8	4.1	9.9	4.7	6.4	1.3
1973	152.1	10.9	31.0	24.3	9.7	4.3	9.6	4.8	5.6	1.1
1974	152.5	11.7	31.1	24.7	9.1	4.8	9.0	4.7	5.6	1.3
1975	147.3	12.1	30.3	22.4	8.9	4.0	8.8	4.3	4.7	1.2
1976	146.0	12.4	29.9	22.5	9.1	4.4	8.5	4.4	4.4	1.3
1977	147.1	13.9	30.6	22.7	9.1	3.8	7.4	4.4	4.8	1.3
1978	147.6	15.0	29.5	22.7	9.0	4.5	7.4	4.6	4.7	1.3
1979	150.2	16.3	29.8	23.3	9.1	4.4	7.2	4.3	4.2	1.2
1980	148.4	17.1	29.7	22.2	8.6	4.6	6.8	4.2	3.7	1.2
1981	149.0	17.9	30.1	21.6	8.5	4.5	7.5	4.1	3.9	1.3
1982	149.3	19.5	29.7	20.3	8.8	4.9	6.7	4.1	3.9	1.5
1983	149.4	19.9	30.4	19.9	8.2	4.9	6.5	4.2	3.9	1.5
1984	151.8	22.2	30.7	20.4	8.7	4.7	5.7	4.0	3.5	1.5
1985	154.8	23.8	31.8	19.8	8.5	5.0	6.0	3.8	3.3	1.6
1986	154.3	24.0	32.0	19.7	8.2	5.1	6.1	3.6	3.2	1.3
1987	154.0	25.3	31.3	19.6	8.2	5.2	5.7	4.1	3.0	1.5
1988	155.3	26.9	31.4	18.8	8.4	5.0	5.1	3.6	3.0	1.3
1989	153.0	27.0	31.2	17.6	8.1	5.5	5.5	3.7	2.9	1.4
1990	153.0	27.6	31.3	17.7	8.1	5.5	5.0	3.9	3.0	1.2
1991	153.5	29.5	30.1	16.8	7.8	5.7	4.9	3.5	2.8	1.4
1992	153.1	29.6	30.4	16.6	7.8	5.5	4.9	3.5	2.4	1.5
1993	154.8	31.7	29.4	16.6	8.0	5.5	4.5	3.4	2.6	1.5
1994	155.0	31.9	30.0	16.1	8.1	5.7	4.5	3.2	2.7	1.5
1995	151.8	31.3	28.7	16.2	7.7	5.9	4.6	3.6	2.4	1.6
1996	155.1	33.6	28.9	15.7	8.2	5.8	4.4	3.4	2.6	1.5
1997	148.5	32.3	27.4	15.2	7.6	5.7	3.9	3.3	2.4	1.5
1998*	151.9	34.5	27.8	14.7	7.8	6.0	3.9	3.3	2.3	1.5
1999*	151.6	35.4	27.4	14.3	7.7	6.0	3.7	3.2	2.3	1.6
2000*	151.4	36.2	27.0	13.9	7.7	6.1	3.6	3.2	2.2	1.6

* Estimated rates

Note: Rates are standardized to the age distribution of the 1991 Canadian population.

Source: Cancer Bureau, LCDC, Health Canada

Table 9

Average Annual Percent Change (AAPC) in Age-Standardized Incidence (1988-1995) and Mortality (1988-1997) Rates for Selected Cancer Sites

	AAPC in Incidence 1988-1995		AAPC in Mortality 1988-1997	
	Males	Females	Males	Females
All Cancers	**0.5**	**0.2**	**-0.9****	**-0.2**
Oral	-2.4**	-0.2	-2.0**	-0.9
Stomach	-3.6**	-2.7**	-3.6**	-2.8**
Colorectal	-0.5	-1.1**	-1.4**	-1.9**
Pancreas	-1.3*	–	-1.4**	0.1
Larynx	-2.2**	-2.1	-2.5**	-1.6
Lung	-1.6**	2.5**	-1.6**	2.5**
Melanoma	1.7	0.6	1.6*	1.8*
Female Breast	–	0.3	–	-1.3**
Body of Uterus	–	-0.4	–	-1.1
Cervix	–	-1.5**	–	-2.3**
Ovary	–	0.3	–	-0.5
Prostate	5.1*	–	-0.5	–
Testis	1.6	–	-3.7	–
Bladder	-1.9**	-2.1*	-1.2*	-1.4
Kidney	-0.1	0.7	-0.4	-1.0
Brain	-0.2	–	-0.6	-1.1*
Thyroid	3.5*	6.3**	1.0	1.3
Non-Hodgkin's Lymphoma	1.7**	1.8**	1.1**	1.3**
Hodgkin's Disease	-1.2	-0.2	-5.0**	-4.9*
Multiple Myeloma	-0.3	–	0.7	0.1
Leukemia	-1.0*	-0.9	-1.1	-1.6**

– Not applicable

* Significant at p=0.05

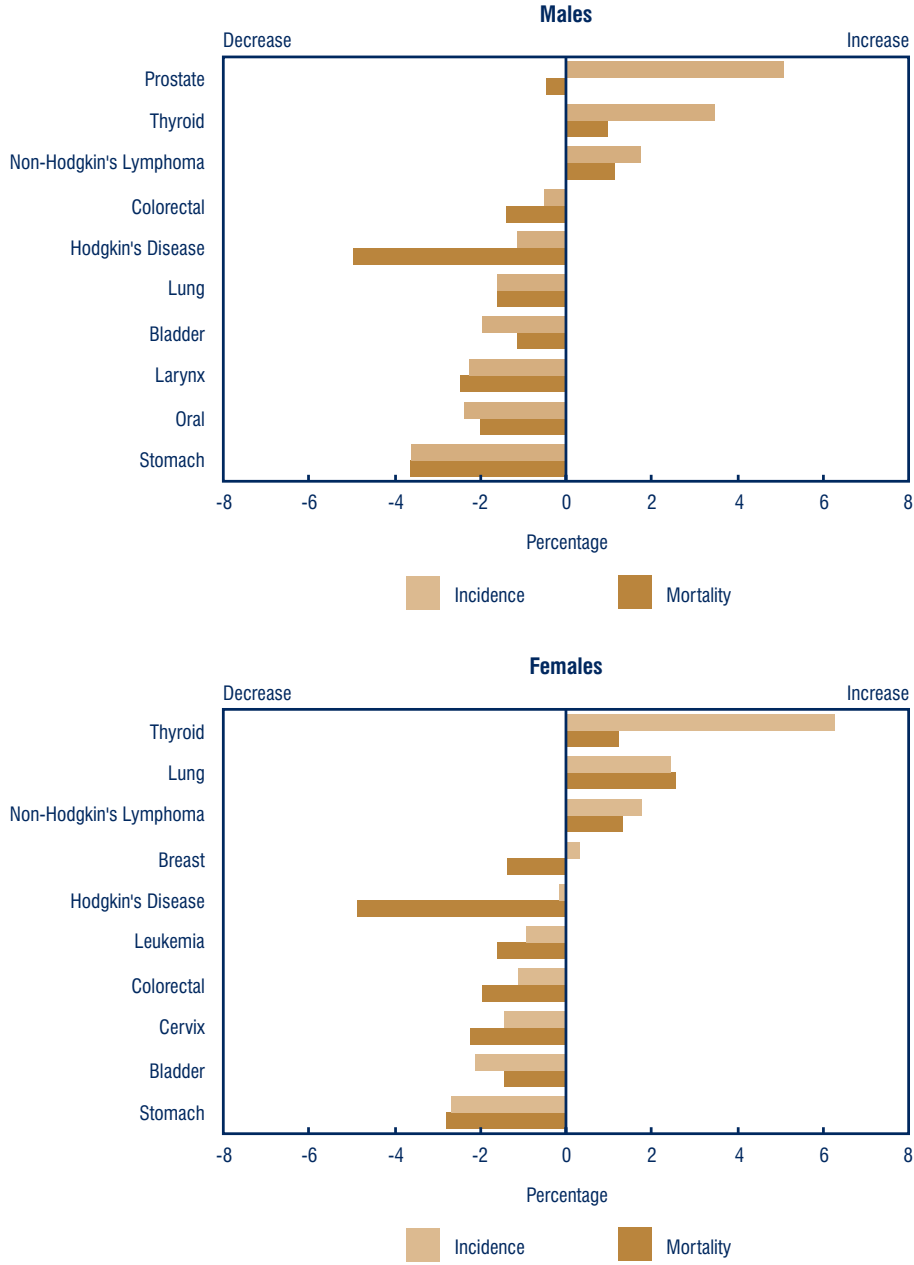
** Significant at p=0.01

Note: Average Annual Percent Change is calculated assuming a log linear model; incidence rates exclude non-melanoma skin cancer (ICD-9 173).

Source: Cancer Bureau, LCDC, Health Canada

Figure 5

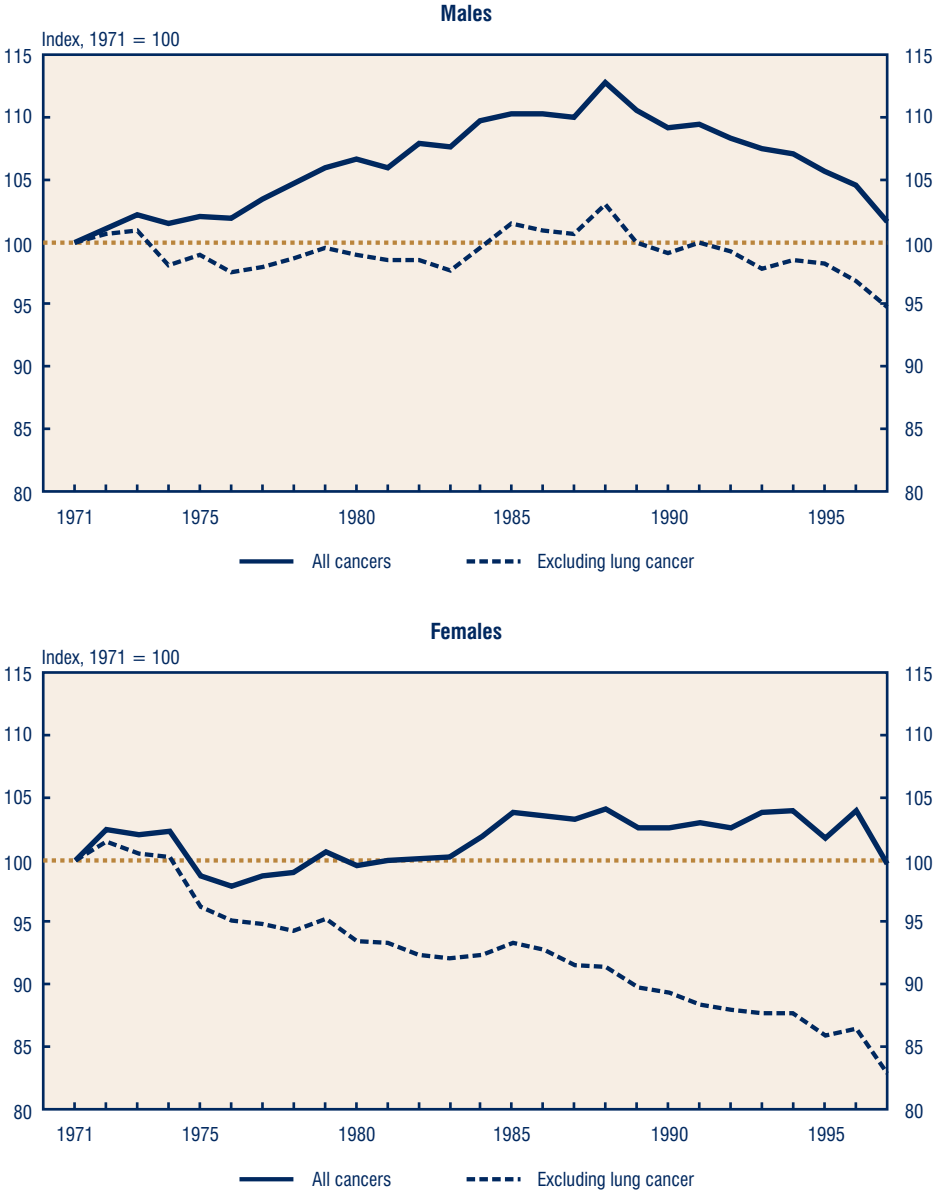
Average Annual Percent Change (AAPC) in Age-Standardized Incidence (1988-1995) and Mortality (1988-1997) Rates for Selected Cancer Sites



Note: See Table 9 for percent change for all sites. Sites are ranked in decreasing order of incidence.
Source: Cancer Bureau, LCDC, Health Canada

Figure 6

Index of Age-Standardized Mortality Rates Including and Excluding Lung Cancer, 1971-1997



Note: Rates are standardized to the age distribution of the 1991 Canadian population. See also the Glossary and Appendix I: Methods.

Source: Cancer Bureau, LCDC, Health Canada

AGE AND GENDER DISTRIBUTION OF CANCER

This section shows estimates for the year 2000 by 10-year age groups for all sites combined (Table 10) and for the four leading types of cancer (Table 11). Cancer is primarily a disease of the elderly. The estimates for 2000 shown in Table 10 indicate that 60,300 new cases (46%) and 38,200 cancer deaths (59%) occur in Canadians aged 70 years or more, while an additional 31,800 new cases (24%) and 14,300 deaths (22%) occur in those aged 60-69. By contrast, just 1% of new cases and only 0.3% of deaths occur prior to age 20. Estimates for leading sites in people aged 20 or more (Table 11) show that close to 50% or more of all newly diagnosed cancers of the lung, prostate, colon and rectum occur among Canadians aged 70 or more. This is especially true for cases of prostate cancer, of which 62% (and 83% of deaths) occur in men over 70. For breast cancer, 22% of cases occur in women under age 50, 45% occur in women aged 50 to 69, and 32% in women aged 70 and over.

Trends in rates of incidence and mortality since 1970 for all cancers are plotted by four age groups with actual and estimated rates (Figure 7). Since 1981, absolute increases in cancer incidence/rates have occurred primarily in Canadians aged 50 or over, and this trend has been stronger among men than women. The difference is almost certainly due to the rapid increases observed in prostate cancer.

Most encouraging is the fairly steady decline in mortality that has occurred since 1988 among both men and women in all age groups under 70 years. Mortality rates have generally declined substantially since 1970 among Canadians aged 0-19, with more moderate declines in the 20-49 age group. Among 50-69 year-old men and women, decreases in mortality rates have occurred primarily since the late 1980s.

Age-specific rates of cancer incidence and mortality by five-year age groups are plotted using actual data for cancer incidence in 1995 and mortality in 1997, the most recent years for which complete data are available (Figure 8). Cancer incidence and mortality increased substantially with age in both sexes, 17 times as many new cases occurring in those over 80 years old than among those under 20, despite an 88% drop in population. Although incidence rates were somewhat higher among women than men between 20 and 59 years of age, for all other age groups incidence was higher among men. This is due to the higher incidence of cancers of the breast and genital organs in women of reproductive age, and the higher incidence of most types of cancer in older men.

Table 10
Distribution by Age Group and Gender, 2000

Age Group	Population (000s) 2000 Estimates			New Cases 2000 Estimates			Deaths 2000 Estimates		
	Total	M	F	Total	M	F	Total	M	F
0-19	8,038	4,117	3,921	1,350	710	620	220	120	100
20-29	4,249	2,156	2,093	1,650	770	890	250	130	120
30-39	5,122	2,585	2,537	4,800	1,900	2,900	880	370	520
40-49	4,995	2,498	2,497	11,300	3,900	7,400	3,300	1,450	1,900
50-59	3,653	1,822	1,830	20,900	9,300	11,600	7,900	4,100	3,800
60-69	2,417	1,173	1,244	31,800	18,300	13,600	14,300	8,300	6,000
70-79	1,832	800	1,031	37,900	21,900	16,000	20,700	11,700	9,000
80+	960	324	636	22,400	11,000	11,300	17,500	8,500	9,000
All Ages	**31,265**	**15,476**	**15,789**	**132,100**	**67,900**	**64,300**	**65,000**	**34,600**	**30,400**

Note: Incidence figures exclude non-melenoma skin cancer (ICD-9 173). Totals may not equal the sum of the parts due to rounding. Please refer to Appendix I: Methods for further details. 2000 population projections were provided by the Census and Demographics Branch, Statistics Canada.

Source: Cancer Bureau, LCDC, Health Canada

Table 11
Distribution by Selected Cancer Site, Age Group and Gender, 2000

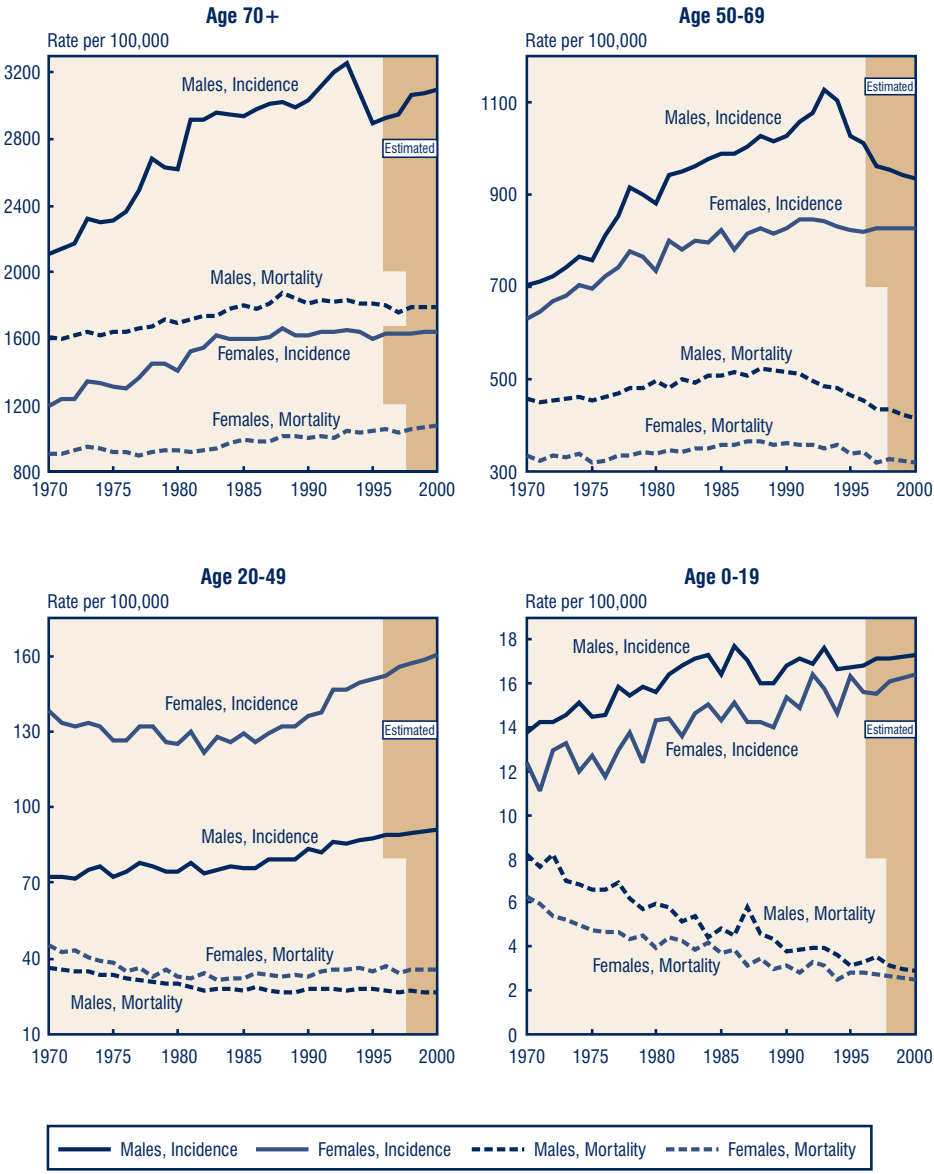
Age Group	Lung			Colorectal			Prostate	Breast
	Total	M	F	Total	M	F	M	F
New Cases								
20-29	25	15	10	40	20	20	–	80
30-39	210	100	110	250	130	120	5	890
40-49	1,050	500	550	940	490	450	100	3,300
50-59	3,200	1,700	1,450	2,400	1,400	1,000	1,400	4,600
60-69	6,000	3,700	2,300	4,200	2,600	1,600	5,000	4,100
70-79	6,900	4,300	2,600	5,400	3,000	2,400	6,900	3,900
80+	3,200	1,900	1,350	3,700	1,550	2,200	3,600	2,300
Ages 20+	**20,600**	**12,200**	**8,400**	**17,000**	**9,100**	**7,800**	**16,900**	**19,200**
Deaths								
20-29	5	5	5	10	5	5	–	10
30-39	120	45	70	60	30	30	–	150
40-49	730	340	400	250	130	120	20	600
50-59	2,300	1,300	1,000	740	430	300	120	930
60-69	4,800	3,000	1,800	1,350	850	500	560	970
70-79	6,300	4,000	2,300	2,000	1,150	860	1,500	1,350
80+	3,400	2,000	1,350	2,100	860	1,200	2,000	1,450
Ages 20+	**17,700**	**10,700**	**7,000**	**6,500**	**3,500**	**3,000**	**4,200**	**5,500**

– Fewer than 5 cases.

Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Totals may not equal the sum of the parts due to rounding. Please refer to Appendix I: Methods for further details.

Source: Cancer Bureau, LCDC, Health Canada

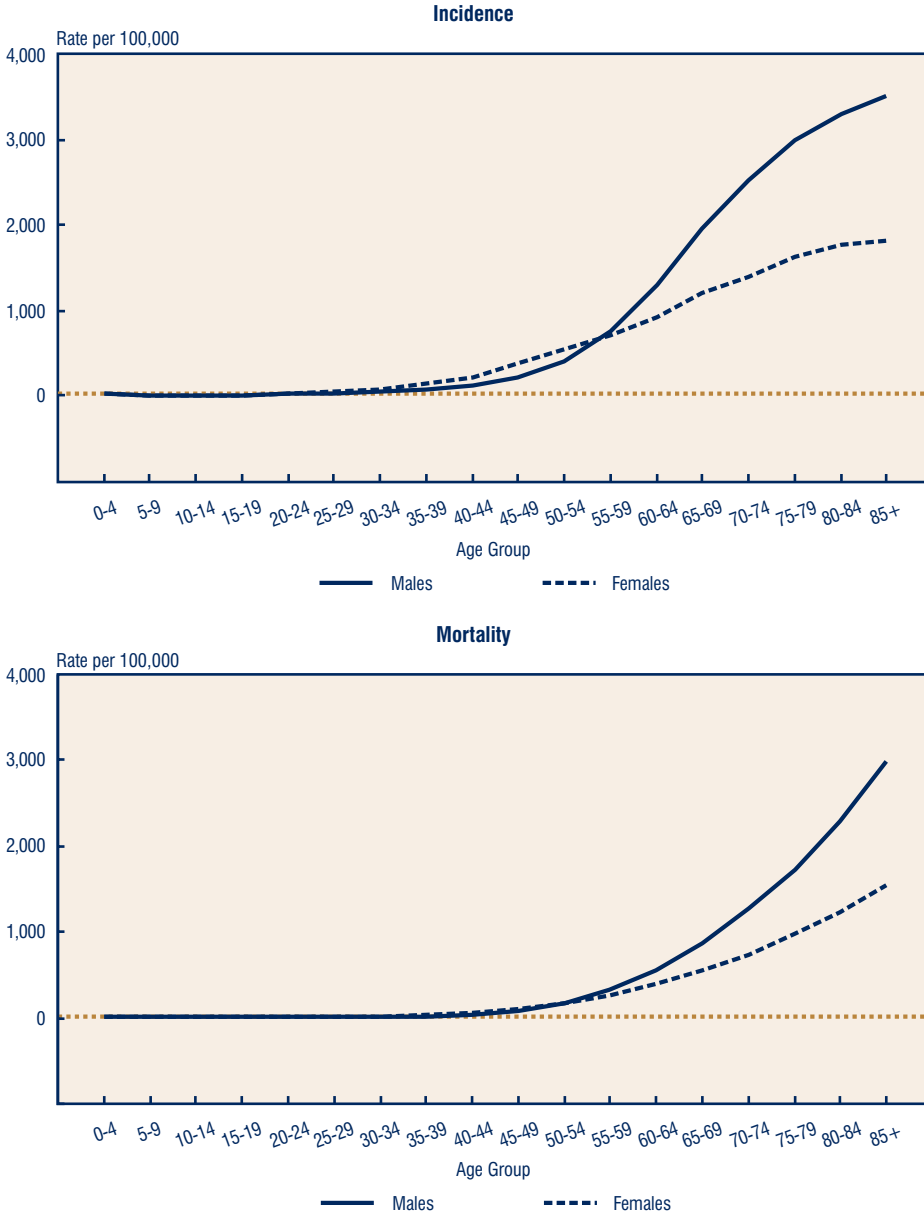
Figure 7
Age-Specific Incidence and Mortality Rates, All Cancers, 1970-2000



Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173).
Source: Cancer Bureau, LCDC, Health Canada

Figure 8

Age-Specific Incidence (1995) and Mortality (1997) Rates for All Cancers by Gender



Note: Incidence rates exclude non-melanoma skin cancer (ICD-9 173).
Source: Cancer Bureau, LCDC, Health Canada

PROBABILITY OF DEVELOPING/DYING FROM CANCER

Table 12 presents the probability (expressed as a percentage) of Canadians developing the more common cancers within specific decades of age, as well as the lifetime probability of developing, or dying from, one of these cancers. The calculation of these probabilities models the occurrence of cancer in a hypothetical cohort. For example, if a cohort of 1,000 men of age 50 are followed until they reach the end of age 59, 56 of them, or 5.6% (1 in 18), will develop some type of cancer within this 10 year period; this percentage therefore describes the risk of a 50-year-old man developing some type of cancer before age 60. Similarly, a 60-year-old woman has a 9.9% (1 in 10) chance of developing some type of cancer before age 70. For the lifetime probability of developing cancer, the data are presented both as the probability, expressed as a percentage, of developing cancer, and as the inverse of that probability. For example, men have a lifetime probability of 0.404 (40.4%) of developing cancer, while the inverse of that probability is 2.5. Thus, approximately 2 of every 5 men are expected to develop cancer of some site during life. Similarly, 1 in 2.8 women (slightly more than one of every 3 women) will develop cancer during life. One in 3.7 men and 1 in 4.5 women (i.e. more than 1 in 4 and 1 in 5 respectively) will die of cancer.

Although Table 12 displays numbers that are precise to one decimal place, the following discussion will use approximations derived from these numbers to discuss highlights of the table.

During their lifetimes, 1 in 9.5 women are expected to develop breast cancer, the most common cancer (excluding non-melanoma skin cancer) to afflict women, and 1 in 26 women are expected to die from it. One in 18 women will develop colorectal cancer, but only 1 in 39 will die from it. One in 20 will develop lung cancer, and 1 in 22 will die from this disease, making it the most likely cause of cancer death in Canadian women. Over their lifetimes, 1 in 9 men will develop prostate cancer, but only 1 in 27.5 will die from it. One in 11 men will develop lung cancer, and 1 in 12 will die from this condition. Lung cancer is thus by far the leading cause of cancer deaths in Canadian men.

The probability of developing cancer within the next 10 years gives a useful indication of the short-term risk of cancer. Although the lifetime risk of developing breast cancer is 10.6% (1 in 9.5), and although the risk increases with age, the chance of a 60-year-old woman developing breast cancer before age 70 is only 2.9% (1 in 34); this figure may be more meaningful than the lifetime probability statistic for a 60-year-old woman contemplating her risk of breast cancer. Table 12 shows how steeply the risk of developing prostate cancer rises with age. A man has very little probability of developing prostate cancer by age 50. However, a 70-year-old man has a 6.3% (1 in 16) chance of developing prostate cancer by age 80; this percentage represents the highest risk for either men or women of developing a specific cancer in any decade of life.

The decrease in the probability of very old persons (80-89) developing, or dying from, many cancers, in contrast to the general increasing risk with increasing age, is due to the increase in the probability of death from other causes at a very advanced age.

Table 12

Probability of Developing Cancer by Age, and Lifetime Probability of Developing and Dying from Cancer

	Probability (%) of Developing Cancer in next 10 years by age group						Lifetime Probability (%) of: Developing		Dying	
	30-39	40-49	50-59	60-69	70-79	80-89	%	One in:	%	One in:
Male										
All Cancers	**0.7**	**1.7**	**5.6**	**14.3**	**21.1**	**18.0**	**40.4**	**2.5**	**26.7**	**3.7**
Prostate	–	0.1	0.9	4.1	6.3	5.1	11.3	8.9	3.6	27.5
Lung	–	0.2	1.1	3.1	4.6	3.3	8.9	11.2	8.1	12.4
Colorectal	0.1	0.2	0.8	2.0	3.0	2.7	6.3	15.9	2.8	36.2
Bladder	–	0.1	0.3	0.7	1.3	1.4	2.7	37.2	0.9	108.8
Lymphoma	0.1	0.2	0.4	0.7	1.0	1.0	2.7	37.6	1.5	66.2
Oral	–	0.1	0.3	0.5	0.5	0.5	1.5	65.8	0.5	182.1
Kidney	–	0.1	0.3	0.5	0.6	0.5	1.5	68.0	0.7	148.8
Stomach	–	0.1	0.2	0.4	0.7	0.6	1.4	71.4	1.0	96.2
Leukemia	–	0.1	0.1	0.3	0.6	0.7	1.4	73.0	0.9	110.9
Pancreas	–	–	0.2	0.4	0.5	0.6	1.2	84.7	1.2	87.0
Melanoma	0.1	0.1	0.2	0.3	0.3	0.3	1.1	95.2	0.3	335.6
Female										
All Cancers	**1.1**	**3.0**	**6.1**	**9.9**	**13.0**	**10.9**	**35.3**	**2.8**	**22.2**	**4.5**
Breast	0.4	1.3	2.3	2.9	3.2	2.2	10.6	9.5	3.9	25.8
Colorectal	–	0.2	0.6	1.3	2.2	2.2	5.6	18.0	2.5	39.4
Lung	–	0.3	0.8	1.6	1.9	1.2	5.0	19.9	4.5	22.4
Lymphoma	0.1	0.1	0.3	0.5	0.8	0.7	2.3	43.5	1.3	76.9
Body of Uterus	–	0.1	0.4	0.7	0.8	0.4	2.2	46.5	0.5	188.0
Ovary	0.1	0.2	0.3	0.4	0.5	0.4	1.5	64.9	1.1	94.3
Pancreas	–	–	0.1	0.2	0.5	0.5	1.1	90.9	1.3	79.4
Leukemia	–	–	0.1	0.2	0.4	0.4	1.0	96.2	0.7	137.0
Kidney	–	0.1	0.2	0.2	0.4	0.3	1.0	100.0	0.4	250.0
Bladder	–	–	0.1	0.2	0.4	0.4	0.9	108.7	0.4	258.4
Melanoma	0.1	0.1	0.2	0.2	0.2	0.2	0.9	111.1	0.2	487.8
Stomach	–	–	0.1	0.2	0.3	0.4	0.8	120.5	0.7	153.8
Cervix	0.2	0.2	0.1	0.1	0.2	0.1	0.8	125.0	0.3	350.9
Oral	–	–	0.1	0.2	0.2	0.2	0.6	166.7	0.3	374.5

– Value less than 0.05

Note: The probability of developing cancer is calculated according to age- and gender-specific cancer incidence and mortality rates for Canada in 1995 and on life tables based on 1994-1996 all cause mortality rates. The probability of dying from cancer represents the proportion of persons dying from cancer in a cohort subjected to the mortality conditions prevailing in the population at large in 1997. See Appendix I: Methods for details.

Source: Cancer Bureau, LCDC, Health Canada

POTENTIAL YEARS OF LIFE LOST DUE TO CANCER

Figure 9 shows the rank order of the 12 leading causes of potential years of life lost (PYLL) in Canada in 1997. This shows that cancer was the leading cause of PYLL for men and women: 894,000 potential years were lost due to cancer (Table 13), representing 29% of the PYLL resulting from all causes of death. Lung cancer was responsible for 233,000 PYLL, representing 26% of the premature mortality caused by cancer. Diseases of the heart were the second leading cause. As in recent years, among children aged 0-19, cancer ranked as the fifth leading cause of PYLL after perinatal causes, congenital anomalies, other accidents and motor vehicle accidents. The total PYLL due to cancer deaths in children aged 0-19 in 1997 was 17,200 years.

The PYLL due to various types of cancer are presented in Table 13. For men in 1997, the three leading cancers were lung, colorectal, and prostate, accounting for 48% of the PYLL due to cancer. The three leading cancers for women were lung, breast and colorectal, accounting for 52% of PYLL due to cancer. The ranking by relative importance of these cancers for men and women with respect to potential years of life lost has been consistent in recent years. For women, however, the PYLL due to lung cancer, which is slightly greater than for breast cancer, reflects the high rates of lung cancer mortality in women aged 50-79. Among men, although prostate cancer is more common than lung cancer, the PYLL due to lung cancer is four times that due to prostate cancer, reflecting higher mortality rates for lung cancer and the younger age at which men develop and die from this disease.

The premature mortality is higher the more common the cancer, the earlier the age of onset, and the more quickly it leads to death. With regard to the most common cancers for women and men, the PYLL from breast cancer (95,000) far exceed the PYLL for prostate cancer (33,000), reflecting the relatively young age at which women die from breast cancer. In contrast, the PYLL for Hodgkin's disease, at 4,000, reflects a cancer that is less common and relatively curable.

Although the number of men who die from cancer each year exceeds the number of women, the PYLL for women (459,000) is slightly higher than that for men (434,000). This is because women generally live longer than men, and some of the deaths due to female cancers occur at younger ages.

The use of tobacco products is the single most important cause of preventable, premature cancer deaths. In addition, many deaths from other diseases also occur because of smoking (Figure 9). Among men, smoking is responsible for about one-third of PYLL due to all cancers, about one-quarter of PYLL due to diseases of the heart, and about half of PYLL due to respiratory disease. Among women, smoking is responsible for about one-fifth of PYLL due to all cancers.

Table 13
Potential Years of Life Lost Due to Cancer, 1997

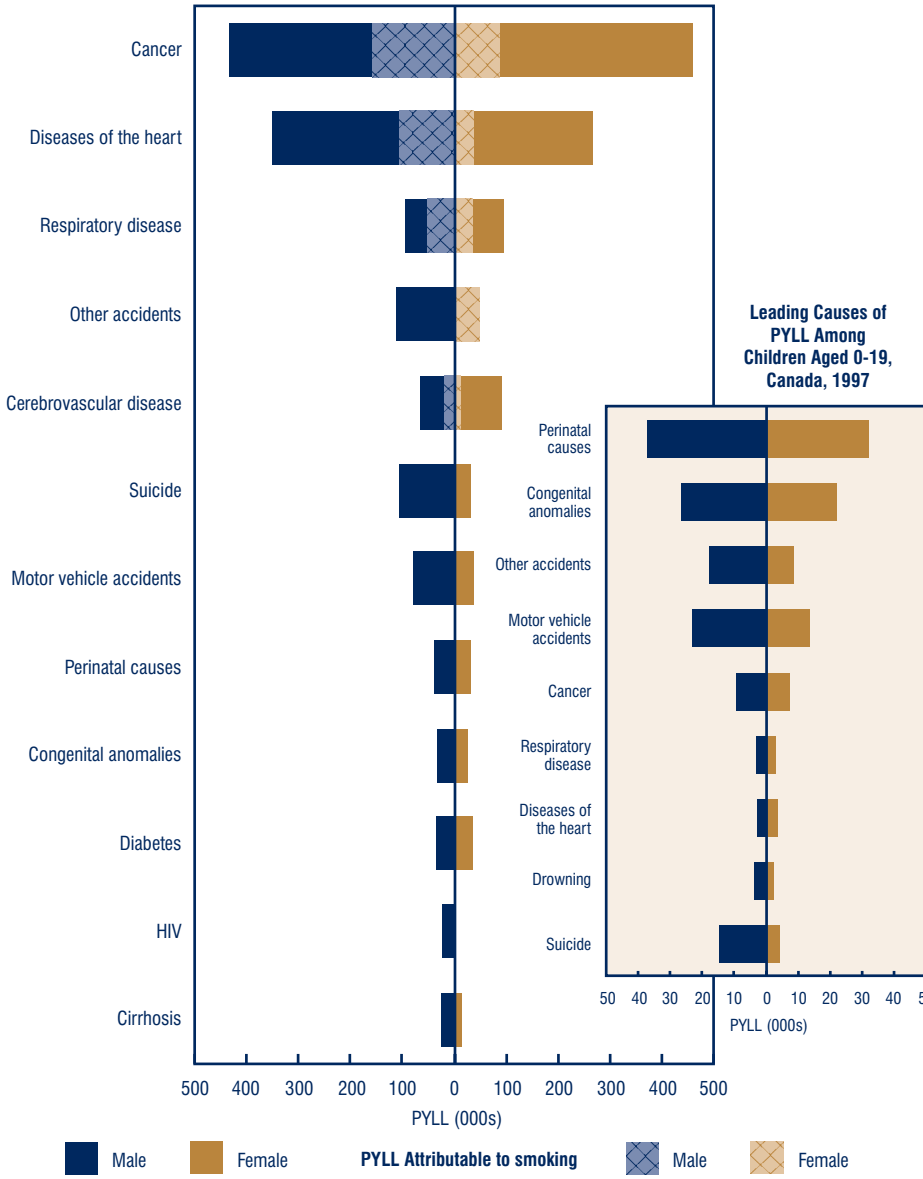
	Potential Years of Life Lost (PYLL)					
	Total		Males		Females	
	Years	%	Years	%	Years	%
ALL CAUSES	3,052,000	–	1,655,000	–	1,398,000	–
All Cancers	894,000	100	434,000	100	459,000	100
Childhood Cancer (Ages 0-19)	17,200	1.9	9,400	2.2	7,700	1.7
Cancer Site						
Lung	233,000	26.0	132,000	30.4	100,000	21.9
Breast	95,000	10.6	–	–	95,000	20.7
Colorectal	84,000	9.5	43,000	9.9	42,000	9.0
Pancreas	40,000	4.5	19,000	4.3	21,000	4.6
Non-Hodgkin's Lymphoma	37,000	4.2	20,000	4.5	18,000	3.9
Leukemia	35,000	3.9	18,000	4.2	16,000	3.5
Brain	34,000	3.8	19,000	4.4	15,000	3.3
Prostate	33,000	3.7	33,000	7.5	–	–
Stomach	27,000	3.0	17,000	3.8	11,000	2.3
Ovary	25,000	2.8	–	–	25,000	5.4
Kidney	19,000	2.2	12,000	2.8	7,000	1.6
Oral	17,000	1.9	11,000	2.6	5,000	1.2
Multiple Myeloma	14,000	1.6	7,000	1.7	7,000	1.4
Bladder	15,000	1.7	10,000	2.3	5,000	1.0
Melanoma	13,000	1.5	8,000	1.8	5,000	1.1
Cervix	11,000	1.2	–	–	11,000	2.3
Body of Uterus	9,000	1.1	–	–	9,000	2.1
Larynx	7,000	0.8	6,000	1.3	1,000	0.3
Hodgkin's Disease	4,000	0.4	2,000	0.5	2,000	0.3
Testis	1,000	0.1	1,000	0.2	–	–

– Not applicable

Note: Figures are ranked in order of total PYLL for both genders combined and are calculated based on life expectancy. Count and percentage totals may not add due to rounding and to the exclusion of other sites. Childhood cancers are also included within the relevant sites.

Source: Cancer Bureau, LCDC, Health Canada

Figure 9
Leading Causes of Potential Years of Life Lost (PYLL), 1997



Note: Figures are ranked in order of total PYLL for both genders combined and are calculated based on life expectancy. Childhood cancers are also included within the relevant sites. Smoking attributable PYLL are based on relative risk estimates from follow up of CPS-II cohort and 1996 Canadian smoking prevalence estimates. See Appendix I: Methods for details.

Source: Cancer Bureau, LCDC, Health Canada

In this edition, the database has been extended to all young people below the age of 20. Direct comparisons with previous editions, therefore, may not be accurate. Although many of the more unique cancers of young children occur less often or not at all in adolescents, other cancers, especially lymphomas and carcinomas, are more frequent.

Table 14 shows the number of new cases of cancer with age-standardized incidence rates (1991-1995) and the number of deaths due to cancer with age-standardized mortality rates (1993-1997) for Canadian children aged 0-19. For these periods, cancer was diagnosed in an average of 1,279 children every year, and 249 died each year from their disease. Leukemia accounted for 26% of new cases and 32% of deaths due to cancer in children, and remains the most common of the childhood cancers. Cancers of the brain and spinal cord, the second most common group of childhood cancers, constituted approximately 17% of new cases and 24% of deaths, and lymphomas accounted for 17% of new cases and 8% of deaths.

An indication of disease prognosis is provided by the ratio of the number of deaths to the number of cases and can be calculated using the data available from Table 14. The deaths to cases ratio for all childhood cancers combined is approximately 0.20. The highest ratios (> 0.27) are found in children with liver (hepatic) cancer, tumours of the sympathetic nervous systems, particularly neuroblastoma, tumours of bone, and tumours of the brain and spinal cord. The high ratio for neuroblastoma reflects the advanced stage at which this disease is frequently diagnosed. Soft tissue sarcomas (0.27), particularly rhabdomyosarcoma (0.31), also have a relatively poor prognosis. The ratio for acute non-lymphocytic leukemia (0.40) was much higher than that observed for acute lymphocytic leukemia (0.13), resulting in a relatively high overall ratio for leukemia. Although the lymphomas have a relatively good prognosis overall, Hodgkin's disease (0.04) has a very low death to cases ratio compared with non-Hodgkin's lymphoma (0.18). The low ratios observed for retinoblastoma and germ cell tumours indicate the low fatality associated with these tumours.

Table 14

New Cases and Age-Standardized Incidence Rates (1991-1995) and Deaths and Age-Standardized Mortality Rates (1993-1997) by Histologic Cell Type for Children Aged 0-19 Years

Diagnostic Group[2]	New cases (1991-1995)[1]		ASIR per 1,000,000 per year	Deaths (1993-1997)		ASMR per 1,000,000 per year	Deaths/ Cases Ratio
	Number	%		Number	%		
Leukemia	**1,648**	**25.8**	**41.83**	**393**	**31.5**	**10.71**	**0.24**
Acute lymphocytic	1,262	19.7	31.96	170	13.6	4.55	0.13
Acute non-lymphocytic	271	4.2	6.92	108	8.7	2.83	0.40
Lymphoma	**1,053**	**16.5**	**26.84**	**102**	**8.2**	**3.77**	**0.10**
Hodgkin's disease	600	9.4	15.30	21	1.7	0.96	0.04
Non-Hodgkin's lymphoma	437	6.8	11.13	80	6.4	2.81	0.18
Brain and Spinal	**1,079**	**16.9**	**27.45**	**300**	**24.1**	**6.76**	**0.28**
Ependymoma	88	1.4	2.23	35	2.8	0.58	0.40
Astrocytoma	568	8.9	14.46	82	6.6	2.29	0.14
Primitive neuroectodermal	233	3.6	5.92	74	5.9	1.55	0.32
Sympathetic Nervous System	**353**	**5.5**	**9.08**	**103**	**8.3**	**1.43**	**0.29**
Neuroblastoma	342	5.3	8.81	103	8.3	1.43	0.30
Retinoblastoma	**128**	**2.0**	**3.28**	**0**	**0.0**	**0.00**	**0.00**
Renal Tumours	**282**	**4.4**	**7.15**	**32**	**2.6**	**0.74**	**0.11**
Wilm's tumour	249	3.9	6.31	25	2.0	0.49	0.10
Hepatic Tumours	**69**	**1.1**	**1.76**	**28**	**2.3**	**0.61**	**0.41**
Bone	**335**	**5.2**	**8.54**	**113**	**9.1**	**4.36**	**0.34**
Osteosarcoma	182	2.8	4.64	66	5.3	2.64	0.36
Ewing's sarcoma	113	1.8	2.88	43	3.5	1.66	0.38
Soft Tissue	**426**	**6.7**	**10.86**	**114**	**9.2**	**3.23**	**0.27**
Rhabdomyosarcoma	207	3.2	5.27	62	5.0	1.63	0.30
Fibrosarcoma	75	1.2	1.92	10	0.8	0.32	0.13
Germ Cell and Other Gonadal	**407**	**6.4**	**10.39**	**14**	**1.1**	**0.53**	**0.03**
Gonadal germ cell tumours	257	4.0	6.56	1	0.1	0.01	0.00
Carcinoma	**495**	**7.7**	**12.63**	**28**	**2.3**	**1.19**	**0.06**
Thyroid	197	3.1	5.02	0	0.0	0.00	0.00
Melanoma	134	2.1	3.42	10	0.8	0.43	0.07
Other Cancers	**118**	**1.8**	**3.03**	**19**	**1.5**	**0.57**	**0.16**
Total (5 years)	**6,393**	**100.0**	**162.84**	**1,246**	**100.0**	**33.89**	**0.19**
Average Per Year	**1,279**			**249**			

[1] Data are shown for the most recent five-year period available and exclude non-melanoma skin cancer (ICD-9 173) and in-situ carcinomas (ICD-9 230-234). Data are grouped according to the International Classification Scheme for Childhood Cancer, World Health Organization (1996). Rates are age-standardized to the 1991 Canadian population and due to disease rarity are expressed **per million per year**.

[2] Only major subcategories within each group are included. Acute lymphocytic includes all lymphoid, approximately 99% are acute. Non-Hodgkin's lymphomas include Burkitt's lymphoma and unspecified lymphomas. The neuroblastoma category includes ganglioneuroblastoma; Wilm's tumour includes rhabdoid and clear cell sarcoma; rhabdomyosarcoma includes embryonal sarcoma and fibrosarcoma includes other fibromatous neoplasms.

Source: Cancer Bureau, LCDC, Health Canada and Health Statistics Division, Statistics Canada

Cancer control refers to the application of existing knowledge regarding approaches designed to actively prevent, cure or manage cancer. These approaches range from prevention through early detection and screening to treatment, encompassing rehabilitation, pain relief and other forms of palliative care. Cancer surveillance is a key component of cancer control. The monitoring and analysis of mortality and incidence trends in cancer contribute significantly to the evaluation of cancer control strategies and their planning.

Decreasing trends in incidence and mortality indicate potential successes of cancer control strategies. A review of selected trends in incidence and mortality provides some insight into our progress against cancer. Effective implementation of a preventive measure leads first to declining incidence rates, with mortality subsequently declining as a consequence of the declines in incidence rates. For example, the reduction in lung cancer mortality rates among men since 1988 (Table 7.2) is consistent with the decrease in men's lung cancer incidence since 1984 (Table 7.1). Further analyses of incidence and mortality trends according to gender and age group, in conjunction with information on trends in risk factors and interventions, such as screening and treatment, are needed to describe and explain these patterns. Such analyses are presented to demonstrate the impact of strategies that relate to the wide range of cancer control activities.

Prevention

Prevention programs aim to reduce exposure to risk factors and to increase exposure to protective factors. Trends in lung cancer can be related to both tobacco consumption and smoking prevalence in the population. There is a lag between initial exposure to tobacco and development of lung cancer, and lung cancer rates start to decline 20 years after declines in smoking prevalence are noted.

Tobacco consumption climbed steadily following World War I, levelled off for a few years during World War II and then rose again, reaching a peak in 1965. Figure 10.1 shows the strong correlation between tobacco consumption (men and women are included) and lung cancer incidence and mortality, particularly among men. The decline in mortality and incidence observed since the mid 1980s among men reflects the drop in tobacco consumption that occurred after 1965, as a result of the health effects of tobacco being firmly established and widely publicized.[11]

The patterns of tobacco use can be looked at in greater detail for more recent years by considering smoking prevalence by age and gender. Smoking prevalence has declined steadily among men in Canada since the 1960s: from about 60% in 1965 to 27% today among men aged 15 and over. Although smoking prevalence was lower among women than men, a decline in smoking rates did not appear until about 15 years later: female smoking prevalence remained at about 38-40% between 1965 and 1979, and then dropped to 23%. The decline in smoking rates among men are now reflected in decreasing incidence and mortality rates, while for women the recent observation of a levelling off in mortality and incidence rates might be the result of the later decline of smoking among women. However, since 1990, declines in smoking prevalence have been confined primarily to Canadians aged 25 and older. Of particular concern is the increasing rate of smoking since 1990 in the 15-19 year age group among both males and females. In this group the rate rose from 21% in 1990 to 28% in 1996 (higher among young women than young men), since when it has remained steady. This presents an important challenge for cancer control.

Screening and Early Detection

These two cancer control strategies are closely related and are grounded in the theory that, for the most part, tumours that are diagnosed early in their development are more responsive to treatment than are those that are diagnosed at a later stage. Screening programs have the goal of finding abnormalities in apparently healthy individuals that may then be further assessed for malignant potential. For some cancers, such as cancer of the cervix, screening is able to identify precursor lesions prior to their developing into an invasive cancer. Early detection results from improvements in diagnostic procedures that allow cancers to be diagnosed earlier. Both incidence and mortality rates may be used to assess effectiveness of screening and early detection. Unlike the case in primary prevention, incidence rates may decline — as a result of the removal of precursor lesions (e.g. in cervical cancer) — or may increase temporarily — because cancers have been diagnosed that would not otherwise have been detected clinically. Whatever the impact on incidence rates, implementation of screening should eventually result in decreased mortality. Because mortality declines may take some years in cancers whose survival rates are relatively favourable, interim markers, such as participation in screening, cancer detection rates at first screen, and rate of advanced cancers, are being used to monitor progress. This report will focus primarily on breast and cervical cancer in Canada as examples of progress in cancer control.

Incidence and mortality rates of *cervical cancer* have declined steadily at least for the past three decades in Canada (Figure 10.3). This remarkable progress can be attributed in large part to the widespread use of Pap smear screening since the 1970s. Currently in Canada, Pap tests are recommended for sexually active women aged 18 and over.[13] Where an organized program is in place, it is suggested that after two normal screens women return for rescreening at least every 3 years until age 69. In 1978, 75% of women aged 15 and over reported ever having had a Pap test, and 59% reported having had their Pap smear in the previous 2 years.[14] Recent data from the National Population Health Survey for 1994/95 and 1996/97[15] indicate that about three-quarters of women aged 18 to 69 reported having had a Pap smear in the previous 3 years.[15] Further analysis of cervical cancer incidence indicates that the decrease in incidence might be slowing down in recent years, especially in the age groups under 50. (Figure 10.3) This could reflect a plateau in screening and thus a need for better targeting of screening promotion activities.

In breast cancer screening, randomized controlled trials indicate that a 30% mortality reduction in breast cancer can be expected in a population aged 50-69 in which at least 70% of women are screened every 2 years.[16-18] However, mortality declines are not expected to be apparent until about 7 years after a high level of screening participation has been achieved.[16-18]

Breast cancer incidence rates rose from around 90 per 100,000 in the mid-1980s up to a peak of 102 per 100,000 in 1992 and then dropped slightly to about 98 per 100,000. The increase occurred primarily in women aged 50 to 69 (Figure 10.3). This pattern is consistent with the dissemination of mammography as a screening test in Canada around 1986.[13,15,19] Current recommendations state that asymptomatic women 50 to 69 should undergo screening biennially. In Canada, women obtain screening mammograms in both opportunistic and screening program settings. In 1994-95, the National Population Health Survey[15] reported that over one-half (56.7%) of women aged 50-69 indicated that they had had a mammogram in the previous 2 years. This increased to

63.5% in the 1996-97 survey.[15] Within organized programs, the number of screening visits has increased substantially, from 4,475 in 1988 to 310,359 in 1996.[20]

In Canada, breast cancer mortality rates were relatively stable from 1950 onwards, with rates fluctuating between 30 and 32 per 100,000 (Figure 10.3). Since 1990, a downward trend has emerged, with mortality rates dropping to 27 per 100,000 in 1997 from 31 in 1990. These declines have occurred in the age groups 20-49 and 50-69 (Figure 10.3). It is likely that both screening and improved treatments have contributed to this favourable trend. A recent report from the Canadian Breast Cancer Screening Database indicates that province-based screening programs are achieving favourable outcome indicators: among women aged 50 to 69, 51.8% of invasive cancers were less than 15 mm in diameter, and 76.6% of invasive cancers did not have lymph node metastases at the time of diagnosis.[20] These results show that province-based screening programs compare well with internationally established outcome indicators. The characteristics of screen-detected cancers fall within the ranges set by screening programs in other countries.[20] It is possible that screening has started to contribute, in part, to the declines in mortality in that age group, but several more years of data will be needed to confirm the contribution of breast cancer screening to the mortality decrease.

Treatment

Cancer treatment aims to reduce or eliminate morbidity in patients diagnosed with cancer, thereby improving survival. Both curative and palliative forms of treatment are used to improve the patient's quality of life. A pattern of declining mortality rates with increasing or relatively unchanging incidence rates indicates that there was an improvement in survival, which could be partly due to implementation of more effective treatment.

Some successes have occurred in cancer treatment in Canada. Figure 10.4 shows declines in mortality for childhood cancer (0-19), and cancer of the testis and Hodgkin's disease for all ages, whereas incidence rates for these diseases remained relatively unchanged. The timing of the declines can be correlated with treatment advances that resulted in rapid improvements in survival for a large proportion of patients with these diseases. Since the early 1950s, mortality rates for childhood cancer have declined by more than 50%, with most of the improvement occurring after 1970. Improved survival has been particularly dramatic for the most common childhood neoplasm, acute lymphocytic leukemia, as well as for lymphomas and kidney cancer. Although essentially no one survived childhood leukemia 40 years ago,[21] currently, approximately 80% of Canadian children and teenagers diagnosed with acute lymphoblastic leukemia are alive 5 years after diagnosis.[22] The improvement in childhood cancer survival relative to that of most adults with cancer reflects biological differences in cancer in adults as compared with children, as well as in treatment approaches. The success of clinical trials in identifying new agents and treatment modalities has been significant; a much larger proportion of children than adults with cancer participate in therapeutic trials. As well, a shift towards multidisciplinary care has improved overall outcomes and decreased morbidity.

The impact of treatment for many forms of cancer may be more subtle and may take 10 or 15 years for reductions in mortality rates in the population to become apparent. This may be the case with breast cancer, for which treatment advances have been implemented at various times over the past 20 years for various groups of women.

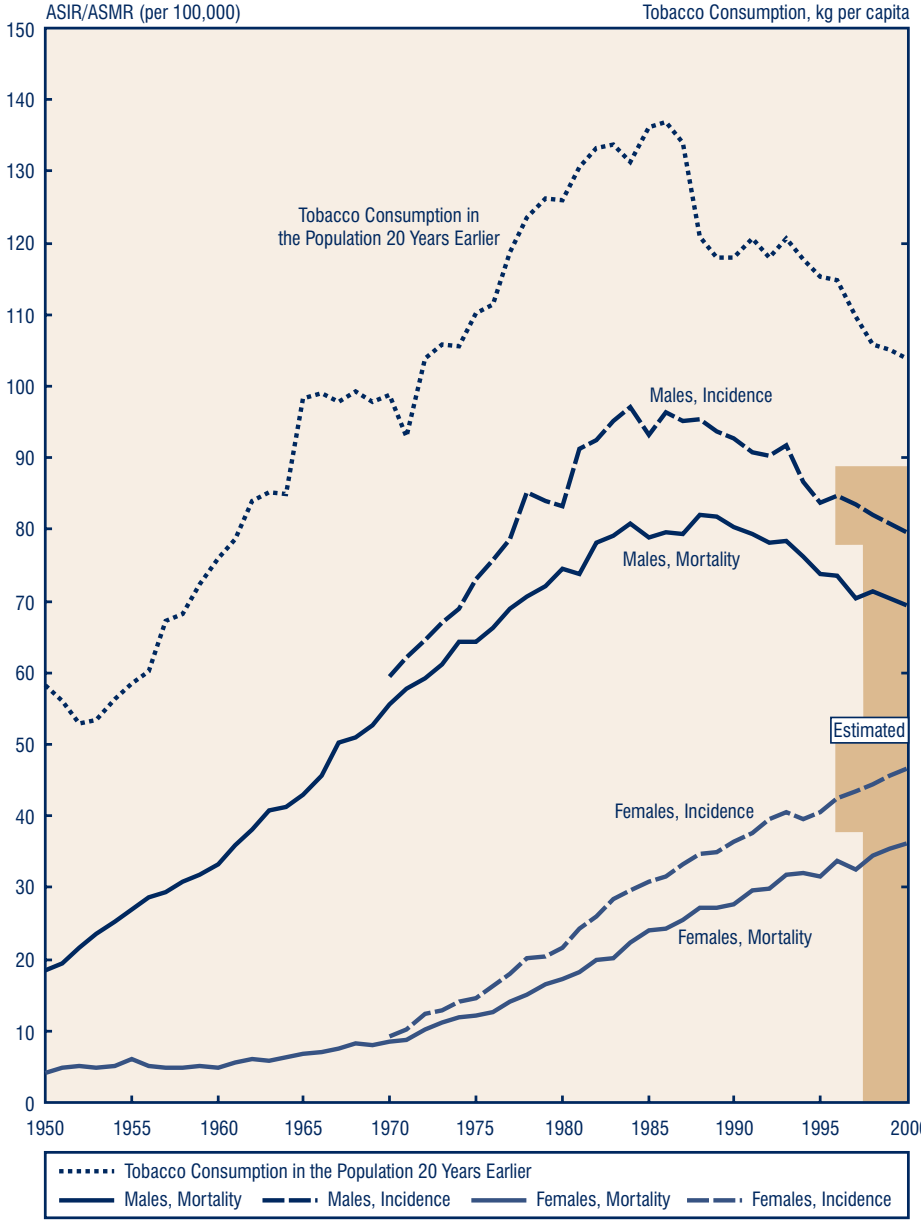
Thus, the declining rates of breast cancer mortality occurring among women under 50 (Figure 10.3) are most likely due to treatment, and treatment could also be contributing to declines among women aged 50 to 69.[23]

Conclusion

Canada has experienced considerable progress in the war against cancer, and this is particularly evident in the last decade. Although these are important accomplishments, further challenges must be overcome if we are to continue to make progress in cancer control. These examples demonstrate that advances are needed in the full range of cancer control activities, including prevention, early detection and treatment, in order to maximize further reductions in cancer incidence and mortality.

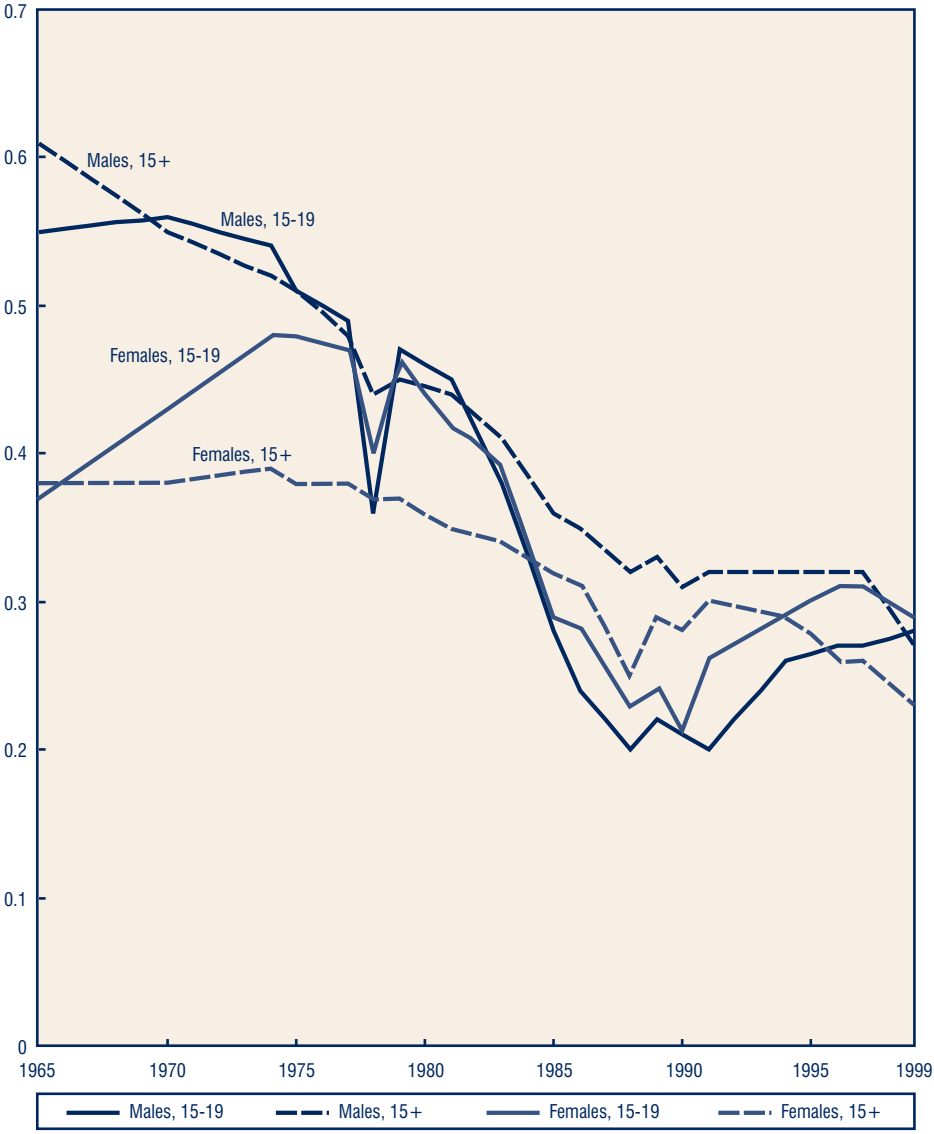
Figure 10.1

Lung Cancer Incidence and Mortality Rates and Tobacco Consumption 20 Years Earlier



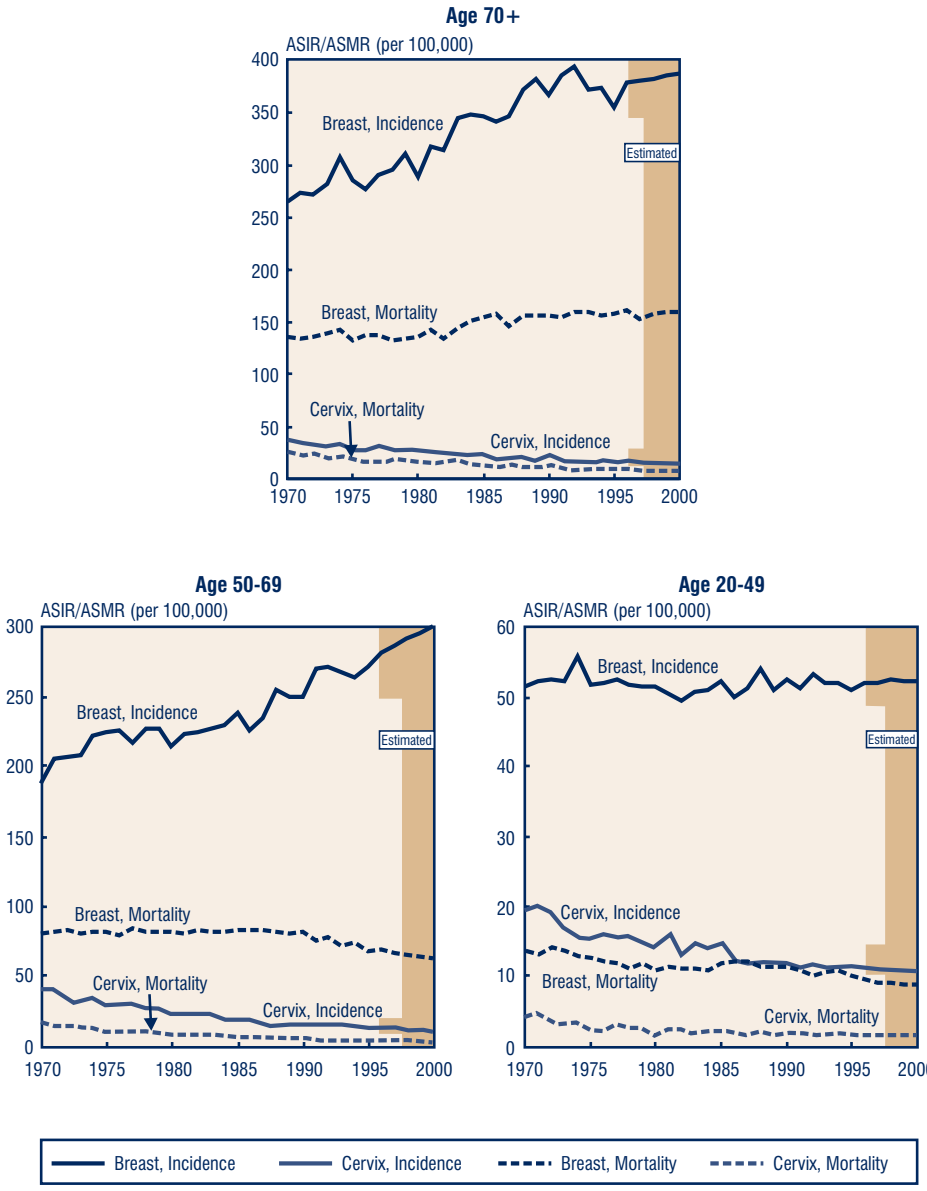
Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Cancer Bureau, LCDC, Health Canada

Figure 10.2
Smoking Prevalence by Gender, Ages 15+ and 15-19, 1965-1999



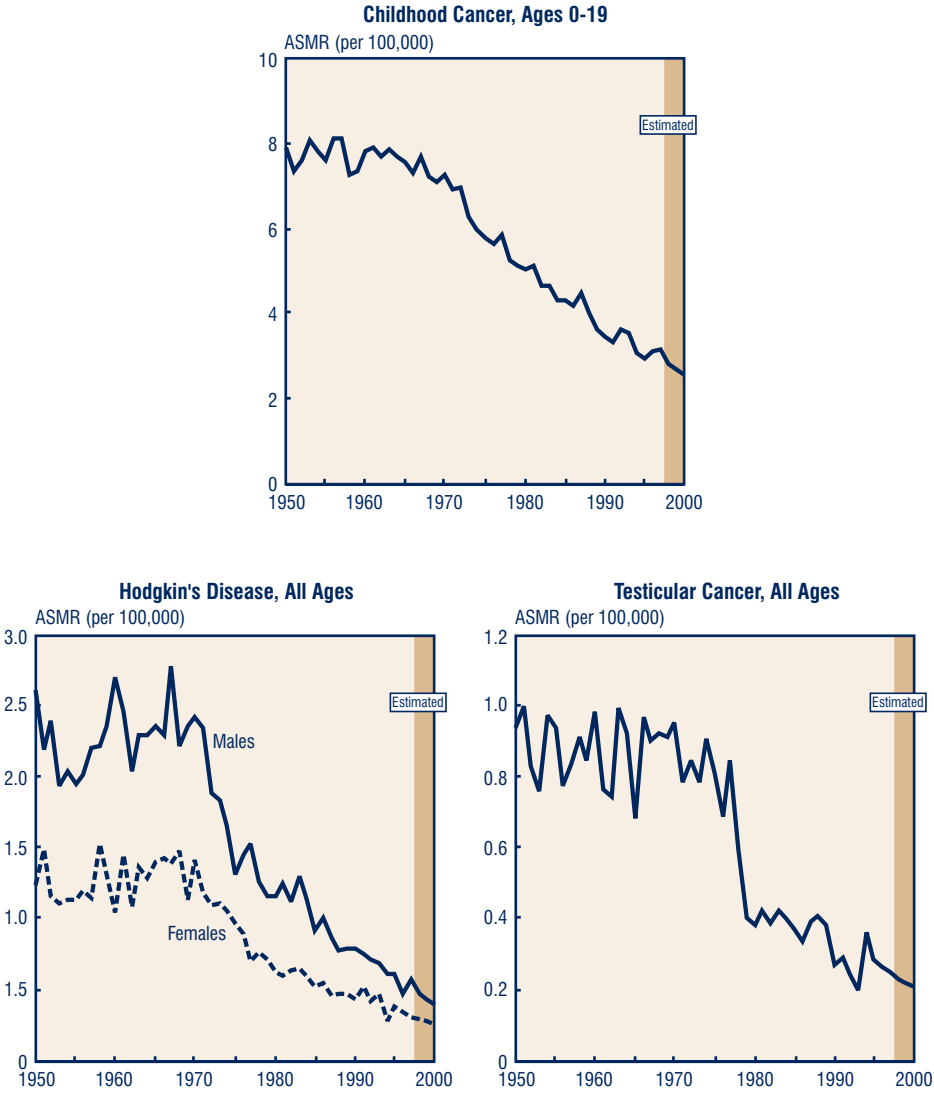
Note: The following sources were used for each stated year, and other data points are interpolated linearly: 1978, Canada Health Survey; 1985, Canada's Health Promotion Survey; 1989 National Alcohol and Other Drugs Survey; 1990, Canada's Health Promotion Survey; all other years from 1965-1990, Labour Force Survey Supplements; 1991, General Social Survey; 1994, Survey on Smoking in Canada - Cycle 1, 1996-97, National Population Health Survey; 1999, CTUMS (Canadian Tobacco Use Monitoring Survey, Wave 1).

Figure 10.3
Breast and Cervix Age-Standardized Rates, by Age Group, 1970-2000



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Cancer Bureau, LCDC, Health Canada

Figure 10.4
Age-Standardized Mortality Rates (ASMR), 1950-2000



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Cancer Bureau, LCDC, Health Canada

GLOSSARY

Age The age of the patient (in completed years) at the time of diagnosis or death.

ICD-9 The Ninth Revision of the International Classification of Diseases.

Incidence The number of new cases of a given type of cancer diagnosed during the year. The basic unit of reporting is a new case of cancer rather than an individual patient.

Mortality The number of deaths attributed to a particular type of cancer that occurred during the year. Included are deaths of patients diagnosed in earlier years, persons with a new diagnosis during the year, and patients for whom a diagnosis of cancer is made only after death.

Province/ Territory For cancer incidence and mortality data, this is the province/territory of the patient's permanent residence at time of diagnosis or death, which may or may not correspond to the province/territory in which the new case of cancer or the cancer death was registered.

Incidence and Mortality Rates

Crude rate The number of new cases of cancer or cancer deaths during the year, expressed as a rate per 100,000 persons in the population.

Age-specific rate The number of new cases of cancer or cancer deaths during the year, expressed as a rate per 100,000 persons in a given age group.

Age-standardized rate The number of new cases of cancer or cancer deaths per 100,000 that would have occurred in the standard population (1991 Canadian population) if the actual age-specific rates observed in a given population had prevailed in the standard population.

Index of age-standardized rates The age-standardized rate of the base year, 1971, is set at 100. Index values for subsequent years are derived by multiplying the age-standardized rate for the year by 100 and then dividing by the 1971 rate.

Site Definitions:

Cancer data presented in this monograph are classified according to the following site groupings, except where otherwise noted.

Site	ICD-9	Site	ICD-9
Oral	140-149	Prostate	185
Esophagus/Oesophagus	150	Testis	186
Stomach	151	Bladder	188
Colorectal	153-154	Kidney	189
Pancreas	157	Brain	191-192
Larynx	161	Thyroid	193
Lung	162	Lymphoma	200-203
Melanoma	172	Hodgkin's Disease	201
Female Breast	174	Multiple Myeloma	203
Cervix	180	Non-Hodgkin's Lymphoma	200,202
Body of Uterus	179,182	Leukemia	204-208
Ovary	183	All Cancers excluding Lung	140-208 excluding 173,162
		All Other Cancers	All sites between 155-199 not listed above
All Cancers	**140-208 excluding 173**		

1991 Canadian Population/World Standard Population:

The population used to standardize rates had the following age distribution.

Population			Population			Population		
Age Group	Canadian	World Standard	Age Group	Canadian	World Standard	Age Group	Canadian	World Standard
0-4	6,946.4	12,000	30-34	9,240.0	6,000	60-64	4,232.6	4,000
5-9	6,945.4	10,000	35-39	8,338.8	6,000	65-69	3,857.0	3,000
10-14	6,803.4	9,000	40-44	7,606.3	6,000	70-74	2,965.9	2,000
15-19	6,849.5	9,000	45-49	5,953.6	6,000	75-79	2,212.7	1,000
20-24	7,501.6	8,000	50-54	4,764.9	5,000	80-84	1,359.5	500
25-29	8,994.4	8,000	55-59	4,404.1	4,000	85+	1,023.7	500
						TOTAL	100,000	

Source: The Canadian population distribution is based on the final post-censal estimates of the July 1, 1991, Canadian population, adjusted for census undercoverage. The World Standard Population is used in *Cancer Incidence in Five Continents*.[2]

APPENDIX I: METHODS

Data Sources and Processing

The actual cancer incidence and mortality data used in this monograph were obtained from four sources: mortality data files (1950-1997),[24] the National Cancer Incidence Reporting System (NCIRS, 1969-1991),[1] the Canadian Cancer Registry (CCR, 1992-1997)[1] and the *fichier des tumeurs du Québec* (1995).[25] These databases are all maintained by the Health Statistics Division at Statistics Canada.

Actual mortality data were available for all the provinces and territories for the period 1969 to 1997. By contrast, actual cancer incidence data at the Canadian level were available for the period 1969-1995. In addition, 1996 incidence data were available for all provinces except Quebec. Data for Prince Edward Island, Nova Scotia, New Brunswick, Manitoba, Alberta, British Columbia, the Yukon Territory, the Northwest Territories and Nunavut were available to 1997.

Records from each province were extracted and then classified by gender, age group and selected cancer sites as defined in the *Glossary*. Canada totals for selected sites were then determined as the sum of the 10 provinces and three territories.

Population figures for Canada, the provinces and the territories were taken from intercensal estimates for the period 1971 to 1995,[26-28] from postcensal estimates for the period 1996-1998,[28] and from the Scenario 2 population projections for 1999 and 2000.[28] The population estimates from 1971 to 1998 and the population projections include non-permanent residents as part of the population. In addition, adjustments are made for net census undercoverage and returning Canadians, and the reference date for the annual estimates is July 1 instead of June 1. The population projections incorporate assumptions of natural increase, immigration and internal migration, which closely reflect the Canadian reality. These assumptions are regularly updated to take into account the most recent changes.

Incidence and mortality estimates for 2000 were extrapolated from models that were fitted to a subset of the data described above. The data series were selected so that they begin in 1986 for both incidence and mortality. This allows consistency between the mortality and incidence estimates and ensures that the estimates accurately account for current trends. For mortality estimates, data from 1986 to 1997 were used. For incidence estimates, data from 1986 to the latest year of available data were used.

Actual crude incidence and mortality rates for each province/territory, gender, site and year were computed by dividing the number of cases by the corresponding provincial/territorial population figures. These rates were computed for the "under 45" and the "45 and over" age groups separately. In order to study the age distributions for all cancers and for the leading types of cancer (lung, colorectal, prostate, and breast), age-specific rates were computed for the age groups 0-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and 80 years and over.

Age-standardized incidence and mortality rates for each site were calculated using the age distribution of the 1991 Canadian population. The World Standard Population[2] was used in publications prior to 1995. It was replaced because it is much younger than the 1991 Canadian population. Consequently, estimates of age-standardized rates prior to 1995 are not comparable with later estimates.

The Northwest Territories represents a different geographic area this year than in the past. Its geographic boundaries were redrawn, reducing the land area representing the Northwest Territories, and a new territory named Nunavut was incorporated from these annexed lands.[29] Estimates for the two territories were based on estimates for the area formerly representing the Northwest Territories, which were split by the proportion of cases/deaths for each of the new areas. The proportions were calculated using five years of data from each area.

Incidence Estimates (New Cases) for 2000

The number of new cases was estimated for each age group, cancer site and gender by fitting Poisson regression models to the provincial and territorial yearly values. The assumption underlying Poisson regression is that the annual incidence counts are independent Poisson random variables with a mean equal to the product of the population size for a particular year and the (true) annual incidence rate. For each province and territory, age group, gender and site, a separate model for crude incidence rates was used, with year as the only independent variable. The estimates for 2000 were obtained by multiplying the extrapolated crude incidence rates with the demographic projections for the same year. Since longer data series for some provinces were available, estimates for Canada were computed as the sum of the estimates for the provinces and the territories.

Occasionally, in cases where the original data show large fluctuations, it has been impossible to obtain results of satisfactory precision from the model. For these exceptions, new cases for 2000 were estimated (after consultation with the provinces) by a five-year average of the most recent available data or by the estimate provided by the province: Prince Edward Island (prostate and female breast); New Brunswick (male — prostate, non-Hodgkin's lymphoma and kidney, female — ovary, uterus, cervix, non-Hodgkin's lymphoma, pancreas and thyroid); Quebec (male — prostate, female — breast, lung and all cancers); Manitoba (male — prostate, non-Hodgkin's lymphoma, melanoma and kidney, female — breast, kidney and melanoma); Saskatchewan (male — prostate, leukemia and larynx); and British Columbia (male — prostate, female — breast, kidney and ovarian).

Prostate cancer presented a special challenge this year because there was evidence that the recent increase in incidence due to early detection would continue no longer. For those provinces that were able to provide actual incidence data up to 1997, these counts of new cases in most instances showed a rapid decline after having reached a peak in 1993. A linear model using the most recently available data going back to 1986 would not fit such data well or offer acceptable 2000 predictions. However, more reasonable predictions of 2000 incidence counts were obtained by fitting a linear model to data from 1980-1989. Actual data from 1990 was therefore considered to be a "blip" in an otherwise smooth trend, and this "blip" was caused by an increase in the use of earlier detection and screening techniques. Incidence counts of prostate cancer in the United States, where a similar "blip" occurred earlier, showed that after reaching the peak, the decline period lasted only a few years, after which the earlier trend continued.[8] A similar situation is therefore expected for Canada.

The estimates of incidence counts for "all cancers" were computed as the sum of the estimated prostate cancer cases (using data from 1980-1989) plus the estimate of "all cancers less prostate" using the standard linear model (based on data from 1986 onwards).

APPENDIX I: METHODS

Mortality Estimates (Deaths) for 2000

The number of deaths was estimated for each age group, site and gender using a method similar to that used for incidence. For each province and territory, a linear model was used for death rates, with year as the only independent variable. Mortality counts by cancer site for Canada were obtained from the estimates of the provincial and territorial counts.

In cases where the original data show large fluctuations, it has been impossible to obtain results of satisfactory precision from the model,. For these exceptions, deaths for 2000 were estimated (after consultation with the provinces) by a five-year average of the most recent available data or the estimate provided by the province: New Brunswick (prostate, kidney and melanoma and female lung and pancreas); Quebec (all cancers); Manitoba (female lung, ovary and kidney); Saskatchewan (female colorectal); Alberta (female lung).

Estimated Age-Standardized Incidence Rates (ASIRs) and Mortality Rates (ASMRs) for 2000

Incidence and mortality rates were generally estimated using weighted least squares regression, with **some exceptions as noted below**. Weights were taken as the inverse of the estimated variances of the actual age-standardized rates. Variances were calculated under the assumption that the age-specific counts used in the computation of the age-standardized rates follow independent Poisson distributions. Regressions were performed for Canada and each province or territory for each site and gender using a linear model, with year as the only independent variable.

Again, in cases where the original data show large fluctuations, it has been impossible to obtain from the model results of satisfactory precision. For these reasons, annual age-standardized incidence rates for 2000 were estimated by actual age-standardized incidence rates calculated over a five-year period for Prince Edward Island (female lung).

As was the case with incidence count estimates, prostate cancer was more difficult to estimate this year. For those provinces that were able to provide actual incidence data beyond 1995, most showed a strong decline in their age-standardized incidence rates after a peak was reached in 1993. A linear model in each province/territory using the most recently available data going back to 1986 would not fit these data well or offer acceptable 2000 predictions. More satisfactory predictions, however, resulted from keeping a linear model fitted for each province/territory to the actual 1980-1989 data. This is similar to the methodology used to estimate prostate cancer incidence counts.

Accuracy and Precision of Estimates

The accuracy of an estimate relates to the question of bias: whether or not an estimate is targeting the value of interest. The precision of an estimate refers to the fact that any estimate has a certain variability to it; one cannot “know” an estimate exactly, and therefore the estimate serves only to provide insight into the real unknown value of interest.

The standard error and coefficient of variation, as well as the confidence interval, are calculated to evaluate the precision of each estimate. The standard error is an estimate

of the extent to which an estimate will vary, while the coefficient of variation relates this variation to the actual size of the quantity being estimated. Confidence intervals use the standard error to create a range of plausible values for the quantity being estimated. These values are available upon request from the Cancer Bureau, Health Canada. Together, these quality measures assess the precision (or imprecision) of a particular estimate but not the accuracy of the estimate. Note that any estimates are subject to error, and the degree of precision depends primarily on the number of observed cases and population size for each site-gender-province combination, while the accuracy is related to the adequacy of the model used in the estimation process.

Because of changes and improvements in the cancer incidence data provided by the provinces, as well as changes in the population estimates and the methodology for producing the estimates of cancer incidence and deaths, estimates in the 2000 report may not be directly comparable with those published in previous years. More detailed information on these methods can be found in technical papers available from Statistics Canada.[30,31]

Estimates of incidence and mortality have been rounded as follows: counts between 0 and 99 to the nearest 5, counts between 100 and 999 to the nearest 10, counts between 1000 and 1999 to the nearest 50 and counts greater or equal to 2000 to the nearest 100. Percentages, age-standardized and age-specific rates were rounded to the nearest tenth except in Tables 4 and 6, where space restrictions forced rounding to the nearest whole number. Age and gender specific counts/rates are combined prior to rounding, so it is possible that totals in the tables do not appear to add up. However, any of these discrepancies must be within the precision of the rounding units described above.

Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality

The AAPC values were calculated for each site by fitting a model that assumed a constant rate of change in the ASIRs or ASMRs, that is, a linear model applied to the ASIRs and ASMRs after logarithmic transformation. The estimated slope resulting from that fit was then transformed back to represent a percentage increase or decrease.

Data from 1988 to 1995 were used for incidence and from 1988 to 1997 for mortality. These series were long enough to create estimates of AAPCs that were both reliable and current.

Estimates of Non-Melanoma Skin Cancer for 2000 in Canada

The pathology laboratories in B.C. send all diagnostic reports of non-melanoma skin cancer to the provincial registry. It is assumed that non-melanoma skin cancer is under-reported to some extent. The age- and gender-specific incidence rates in B.C. for 1985-1994 (in 20-year age groups) have been projected to the current year and applied to the Canadian population estimates to generate a minimal estimate of the number of cases for Canada as a whole.

Probability of Developing/Dying from Cancer

Probabilities were calculated based on the age- and gender-specific cancer incidence and mortality rates for Canada in 1995, and on life tables based on 1994-1996

all-cause mortality rates. The methodology used was that of Zdeb[32] and Seidman.[33] The life table procedures used assumed that the rate of cancer incidence for various age groups in a given chronological period will prevail throughout the future lifetime of a person as he/she advances in age. Since these may not be the rates that will prevail at the time a given age is attained, the probabilities should be regarded only as approximations of the actual ones.

The probability of dying from cancer represents the proportion of persons dying from cancer in a cohort subjected to the mortality conditions prevailing in the population at large in 1997. The indicator was calculated by determining the proportion of deaths attributed to specific types of cancer for each gender and age group, multiplying this proportion by the corresponding number of deaths in the life table and summing the life table deaths over all gender and age groups to obtain the probability of dying from each cause.

The Total Number of New Cases or Deaths, Showing the Contribution of Change in Cancer Risk, Population Growth and Change in Population Age-Structure

Figures 2.3 and 2.4 display the determinants of increases in incidence and mortality for males and females respectively. All three series plotted on each graph use data from 1971 as a baseline. The upper most series is a plot of the actual counts observed or projected. The middle series is an estimate of what the cancer counts or deaths would have been if the age distribution of 1971 was held constant through time. In other words, if the total population of each year, although growing, were forced to have the same percentages in each age range as those present in 1971. This redistribution of the population into 1971 percentages is then multiplied by the annual age- and gender-specific rates and summed over all the age groups to produce an estimate for that year. The final series was produced by summing over all the age groups the product of the age- and gender-specific population counts of 1971 with the corresponding rates in the current year.

Potential Years of Life Lost (PYLL)

The indicator was calculated by obtaining deaths for ages <1, 1-4, 5-9, ..., 90+ for Canada in 1997, and life expectancy at the midpoints of the age groups. The PYLL is the total number of years of life lost obtained by multiplying, for each age group, the number of deaths by the life expectancy of survivors.[34]

Population Attributable Risk (PAR)

Population attributable risk (PAR) estimates used in the PYLL calculations were formed by combining mortality data, smoking prevalence and relative risk estimates by gender, age, and disease. Smoking prevalence was estimated using Statistics Canada's General Social Survey,[35] while relative risk estimates were obtained using SAMMEC II.[36]

Smoking-attributable mortality (SAM) was calculated[37] for disease components with known elevated relative risks within the specific disease range. SAM was estimated as the product of the smoking-attributable fraction (SAF) and the number of deaths in each gender, age group, and disease component. SAF was calculated as follows:

$$SAF = ([P_0 + P_1 (RR_1) + P_2 (RR_2)] - 1) / [P_0 + P_1 (RR_1) + P_2 (RR_2)] ,$$

where: P_0 , P_1 , and P_2 denote never, current and former smoking prevalence respectively, and RR_1 and RR_2 denote relative risk estimates for current and former smokers respectively.

PAR was then calculated as the total SAM divided by the total number of deaths for each gender, age, and disease grouping.

APPENDIX II: ACTUAL DATA FOR NEW CASES AND DEATHS

Table 1

Actual Data for New Cases of Cancer by Site and Gender, 1995

Site	ICD-9	Total	Males	Females
All cancer sites	**140-208**	**116,521**	**60,688**	**55,833**
Oral (buccal cavity and pharynx)	**140-149**	**2,925**	**2,083**	**842**
Lip	140	561	463	98
Tongue	141	564	375	189
Salivary gland	142	280	168	112
Floor of mouth	144	241	166	75
Pharynx	146,147,148	778	595	183
Other and unspecified	143,145,149	501	316	185
Digestive organs	**150-159**	**24,854**	**13,606**	**11,248**
Esophagus	150	1,070	766	304
Stomach	151	2,803	1,758	1,045
Small intestine	152	343	181	162
Large intestine	153	10,234	5,095	5,139
Rectum	154	5,077	3,010	2,067
Liver and biliary passages	155,156	1,832	1,037	795
Pancreas	157	2,849	1,463	1,386
Other and unspecified	158,159	646	296	350
Respiratory system	**160-165**	**19,891**	**12,756**	**7,135**
Larynx	161	1,226	1,003	223
Lung	162	18,043	11,296	6,747
Other and unspecified	160,163,164,165	622	457	165
Bone tissue and skin	**170-172**	**4,076**	**2,142**	**1,934**
Bone	170	282	152	130
Connective tissue	171	713	384	329
Skin (melanoma)	172	3,081	1,606	1,475
Breast	**174,175**	**16,273**	**112**	**16,161**
Genital organs	**179-187**	**22,359**	**15,260**	**7,099**
Cervix	180	1,433	–	1,433
Body of uterus	182	2,960	–	2,960
Ovary	183	2,202	–	2,202
Prostate	185	14,458	14,458	–
Other and unspecified	179,181,184,186,187	1,306	802	504
Urinary organs	**188-189**	**7,821**	**5,313**	**2,508**
Bladder	188	4,498	3,330	1,168
Kidney and other urinary	189	3,323	1,983	1,340
Eye	**190**	**260**	**138**	**122**
Brain and central nervous system	**191-192**	**2,114**	**1,190**	**924**
Endocrine glands	**193-194**	**1,687**	**442**	**1,245**
Thyroid	193	1,529	363	1,166
Other endocrine	194	158	79	79
Leukemia	**204-208**	**3,203**	**1,802**	**1,401**
Other blood and lymph tissues	**200-203**	**7,027**	**3,801**	**3,226**
Hodgkin's disease	201	799	429	370
Multiple myeloma	203	1,419	760	659
Non-Hodgkin's lymphoma	200, 202	4,809	2,612	2,197
All other and unspecified sites	**195-199**	**4,031**	**2,043**	**1,988**

– Not applicable

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases. Figures exclude non-melanoma skin cancer (ICD-9 173). Further information is available at: http://www.hc-sc.gc.ca/hpb/lcdc/webmap (select cancer button).

Source: Cancer Bureau, LCDC, Health Canada

Table 2

Actual Data for Cancer Deaths by Site and Gender, 1997

Site	ICD-9	Total	Males	Females
All cancer sites	**140-208**	**58,703**	**31,555**	**27,148**
Oral (buccal cavity and pharynx)	**140-149**	**1,026**	**705**	**321**
Lip	140	14	10	4
Tongue	141	243	167	76
Salivary gland	142	81	49	32
Floor of mouth	144	40	29	11
Pharynx	146,147,148	293	205	88
Other and unspecified	143,145,149	355	245	110
Digestive organs	**150-159**	**15,643**	**8,595**	**7,048**
Esophagus	150	1,280	940	340
Stomach	151	1,963	1,225	738
Small intestine	152	129	69	60
Large intestine	153	4,749	2,418	2,331
Rectum	154	1,353	798	555
Liver and biliary passages	155,156	1,663	939	724
Pancreas	157	2,847	1,375	1,472
Other and unspecified	158,159	1,659	831	828
Respiratory system	**160-165**	**16,102**	**10,236**	**5,866**
Larynx	161	475	394	81
Lung	162	15,439	9,726	5,713
Other and unspecified	160,163-165	188	116	72
Bone tissue and skin	**170-172**	**1,125**	**642**	**483**
Bone	170	135	82	53
Connective tissue	171	325	160	165
Skin (melanoma)	172	665	400	265
Breast	**174,175**	**4,984**	**38**	**4,946**
Genital organs	**179-187**	**6,209**	**3,677**	**2,532**
Cervix	180	417	–	417
Body of uterus	182	319	–	319
Ovary	183	1,362	–	1,362
Prostate	185	3,622	3,622	–
Other and unspecified	179,181,184,186,187	489	55	434
Urinary organs	**188-189**	**2,660**	**1,779**	**881**
Bladder	188	1,368	960	408
Kidney and other urinary	189	1,292	819	473
Eye	**190**	**33**	**22**	**11**
Brain and central nervous system	**191-192**	**1,448**	**819**	**629**
Endocrine glands	**193-194**	**208**	**76**	**132**
Thyroid	193	138	41	97
Other endocrine	194	70	35	35
Leukemia	**204-208**	**1,973**	**1,096**	**877**
Other blood and lymph tissues	**200-203**	**3,442**	**1,870**	**1,572**
Hodgkin's disease	201	133	83	50
Multiple myeloma	203	1,050	575	475
Non-Hodgkin's lymphoma	200, 202	2,259	1,212	1,047
All other and unspecified sites	**173,195-199**	**3,850**	**2,000**	**1,850**

– Not applicable

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases.

Source: Cancer Bureau, LCDC, Health Canada

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FOR FURTHER INFORMATION

For general information regarding cancer statistics or any other aspect of cancer (such as cancer prevention, screening, diagnosis, treatment and care, etc.), contact the **Canadian Cancer Society's Cancer Information Service at 1-888-939-3333**. A list of the offices of the CCS - the National Office and the Divisional offices - is provided on page 78. Your local CCS office is listed in the white pages of the telephone directory.

For information regarding cancer research sponsored by the **National Cancer Institute of Canada (NCIC)**, with funds provided by the CCS and The Terry Fox Foundation, contact the NCIC at the address listed on page 78.

Information on risk assessment and surveillance of cancer is available from the Cancer Bureau, **Health Canada**, Tunney's Pasture, Ottawa, Ontario, K1A 0L2. Tel. (613) 957-0327, Fax. (613) 941-2057.

Cancer Surveillance On-Line is an interactive, web-based tool for easy access to cancer surveillance data. It allows the user to generate data according to choice of parameters such as cancer site, geographic area, period of time and choice of presentation mode such as tables, charts and maps. See the Health Canada website noted below for the URL.

Detailed standard tables or custom tabulations are available on a cost recovery basis upon request from the Health Statistics Division, **Statistics Canada**, National Enquiries Line: 1-800-263-1136; Health Statistics Division: (613) 951-1746. Analytical articles appear regularly in *Health Reports,* Statistics Canada, Catalogue 82-003, quarterly.

Cancer incidence data are supplied to Statistics Canada by **provincial/territorial cancer registries**. Detailed information regarding the statistics for each province or territory is available from the relevant registry. (See page 79 for addresses, telephone numbers and fax numbers.)

Data contained in this document are available at (http://www.cancer.ca or http://www.ncic.ca). Additional information is also available from:

- Canadian Cancer Society (CCS)
  http://www.cancer.ca
- National Cancer Institute of Canada (NCIC)
  http://www.ncic.cancer.ca
- Health Canada
  http://www.hc-sc.gc.ca/hpb/lcdc/webmap (select cancer button)
- Statistics Canada
  http://www.statcan.ca

NATIONAL CANCER INSTITUTE OF CANADA/ CANADIAN CANCER SOCIETY

National Office

Canadian Cancer Society & National Cancer Institute of Canada
10 Alcorn Avenue, Suite 200
Toronto, Ontario, M4V 3B1
Tel. (416) 934-5673
Fax. (416) 961-4189

Newfoundland & Labrador Division

Canadian Cancer Society
Crosbie Building, 2nd Floor
P.O. Box 8921
1 Crosbie Place, Crosbie Road
St. John's, Newfoundland A1B 3R9
Tel. (709) 753-6520
Fax. (709) 753-9314

Prince Edward Island Division

Canadian Cancer Society
1 Rochford Street, Suite #1
Charlottetown, Prince Edward Island
C1A 9L2
Tel. (902) 566-4007
Fax. (902) 628-8281

Nova Scotia Division

Canadian Cancer Society
5826 South Street, Suite 1
Halifax, Nova Scotia B3H 1S6
Tel. (902) 423-6183
Fax. (902) 429-6563

New Brunswick Division

Canadian Cancer Society
133 Prince William Street
P.O. Box 2089
Saint John, New Brunswick
E2L 3T5
Tel. (506) 634-6272
Fax. (506) 634-3808

Québec Division

Maison de la Société canadienne du cancer
5151 Boul. l'Assomption
Montréal (Québec) H1T 4A9
Tel. (514) 255-5151
Fax. (514) 255-2808

Ontario Division

Canadian Cancer Society
1639 Yonge Street
Toronto, Ontario, M4T 2W6
Tel. (416) 488-5400
Fax. (416) 488-2872

Manitoba Division

Canadian Cancer Society
193 Sherbrook Street
Winnipeg, Manitoba, R3C 2B7
Tel. (204) 774-7483
Fax. (204) 774-7500

Saskatchewan Division

Canadian Cancer Society
1870 Albert Street, Suite 340
Regina, Saskatchewan, S4P 4B7
Tel. (306) 757-4260
Fax. (306) 569-2133

Alberta/N.W.T. Division

Canadian Cancer Society
#200, 2424-4th Street S.W.
Calgary, Alberta, T2S 2T4
Tel. (403) 228-4487
Fax. (403) 228-4506

British Columbia & Yukon Division

Canadian Cancer Society
565 West Tenth Avenue
Vancouver, British Columbia
V5Z 4J4
Tel. (604) 872-4400
Fax. (604) 879-4533

FOR FURTHER INFORMATION

CANADIAN COUNCIL OF CANCER REGISTRIES

NEWFOUNDLAND

Chief Executive Officer
Newfoundland Cancer Treatment and Research Foundation
Murphy Cancer Centre
Health Sciences Centre
300 Prince Philip Drive
St. John's, Newfoundland A1B 3V6
Tel: 709-737-4235 Fax: 709-753-0927

PRINCE EDWARD ISLAND

Director
Oncology Clinic and P.E.I. Cancer Registry
Queen Elizabeth Hospital
Riverside Drive
Charlottetown, Prince Edward Island C1A 8T5
Tel: 902-894-2042 Fax: 902-894-2187
Registry No.: 902-894-2027

NOVA SCOTIA

Director
Nova Scotia Cancer Registry
Cancer Treatment and Research Foundation of Nova Scotia
Room 553, Bethune Building
1278 Tower Road
Halifax, Nova Scotia B3H 2Y9
Tel: 902-473-6058 Fax: 902-473-4425

NEW BRUNSWICK

Provincial Epidemiologist
Director of Provincial Epidemiology Service
Department of Health and Community Services
P.O. Box 5100, 520 King Street, 2nd Floor
Fredericton, New Brunswick E3B 5G8
Tel: 506-453-3092 Fax: 506-453-2780

QUÉBEC

Fichier des tumeurs du Québec
Ministère de la Santé et des Services sociaux
Service du portrait et surveillance de la santé et du bien-être
Direction de l'analyse et surveillance de la santé et du bien-être
1075, Chemin Ste-Foy, 2e étage
Québec, Québec G1S 2M1
Tel: 418-646-4745 Fax: 418-528-2651
www.msss.gouv.qc.ca/fr/statisti/indisp/tumeurs/cadnor.pdf

ONTARIO

Director
Ontario Cancer Registry
Division of Preventive Oncology
Cancer Care Ontario
620 University Avenue
Toronto, Ontario M5G 2L7
Tel: 416-971-9800 Fax: 416-971-6888
www.cancercare.on.ca

MANITOBA

Director
Department of Preventive Oncology and Epidemiology
Manitoba Cancer Treatment and Research Foundation
100 Olivia Street, Winnipeg, Manitoba R3E OV9
Tel: 204-787-2178 Fax: 204-783-6875
www.mctrf.ca/epi/epi_home.html

SASKATCHEWAN

Associate Director
Epidemiology & Preventive Oncology
Saskatchewan Cancer Foundation
Allan Blair Cancer Centre
4101 Dewdney Avenue
Regina, Saskatchewan S4T 7T1
Tel: 306-766-7516 Fax: 306-766-2179

ALBERTA

Director
Epidemiology, Prevention and Screening
Alberta Cancer Board, c/o Room 382
Heritage Medical Research Bldg.
3330 Hospital Drive, N.W.
Calgary, Alberta T2N 4N1
Tel: 403-220-4302 Fax: 403-270-3898
Tel: 403-262-4460

BRITISH COLUMBIA

Director, Cancer Registry
Vancouver Cancer Clinic
B.C. Cancer Agency
600 West Tenth Avenue
Vancouver, British Columbia V5Z 4E6
Tel: 604-877-6000, Local 4602
Fax: 604-660-3645
www.bccancer.bc.ca/

NORTHWEST TERRITORIES/NUNAVUT

Medical Officer and Director
Cancer Registry
Department of Health
Government of the N.W.T.
Box 1320, 5022 49th Street
Centre Square Tower, 6th Floor
Yellowknife, Northwest Territories
X1A 2L9
Tel: 867-920-3231 Fax: 867-873-0442

YUKON

Director of Insured Health Services
Yukon Cancer Registry
Health Services Branch
Yukon Government
Box 2703, Whitehorse, Yukon
Y1A 2C6
Tel: 867-667-5620
Fax: 867-393-6486

STATISTICS CANADA

Director
Health Statistics Division
18-F, R.H. Coats Building
Tunney's Pasture, Ottawa, Ontario
K1A 0T6
Tel: 613-951-8571 Fax: 613-951-0792

EVALUATION AND ORDER FORMS

Please help us improve this publication. Your feedback on the contents of this report will be used to prepare future editions. It would be helpful for planning if you could complete and return this form by August 31, 2000 to:

Canadian Cancer Statistics
Canadian Cancer Society National Office
10 Alcorn Ave., suite 200
Toronto, Ont.
M4V 3B1

However, we will be pleased to receive your completed form at any time.

1. For how many years have you used the Canadian Cancer Statistics booklet?

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2. How do you prefer to access the Canadian Cancer Statistics booklet?
   - ❑ hardcopy
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3. In which of your professional activities does this publication assist you?
   - ❑ planning for cancer care and treatment services
   - ❑ health policy and planning
   - ❑ planning cancer prevention programs
   - ❑ teaching
   - ❑ research — clinical trials
   - ❑ research — other
   - ❑ journalistic reporting
   - ❑ actuarial purposes
   - ❑ fund-raising
   - ❑ other: _____

4. What use will you make of the information in Canadian Cancer Statistics 2000?
   - ❑ as a reference document for current data on cancer
   - ❑ to identify national cancer trends
   - ❑ to compare cancer trends between provinces
   - ❑ as evidence to lobby for more resources for cancer prevention/cancer treatment
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5. Please rate each section of Canadian Cancer Statistics 2000 for its usefulness.

	not useful	somewhat useful	very useful
Highlights	❑	❑	❑
Current incidence and mortality	❑	❑	❑
Geographic patterns of cancer occurrence	❑	❑	❑
Trends in incidence and mortality	❑	❑	❑
Age and gender distribution of cancer	❑	❑	❑
Probability of developing/dying from cancer	❑	❑	❑
Potential years of life lost due to cancer	❑	❑	❑
Cancer in children	❑	❑	❑
Special topic			
Progress in Cancer Control	❑	❑	❑

6. Which figures and tables do you find most useful?

_____

_____

_____

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8. What additional information would you like to see in the text, figures or tables in the next issue?

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9. What special topic would you suggest for future editions?

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Questions About Cancer?

Call the Canadian Cancer Society's
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1-888-939-3333

Monday to Friday: 9 a.m. to 6 p.m.

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