
Canadian Cancer Statistics 1992



Developed by:
Statistics Canada, Health and Welfare Canada
Provincial Cancer Registries, National Cancer Institute of Canada

Canadian Cancer Statistics 1992

Steering Committee Members:

Jane F. Gentleman, Ph.D., Canadian Centre for Health Information,
Statistics Canada

Peter Hayles, Information Systems, British Columbia Cancer Agency

Jack Laidlaw, M.D., Ph.D., F.R.C.P.(C), Canadian Cancer Society (Chair)

John R. McLaughlin, Ph.D., Division of Epidemiology and Statistics,

The Ontario Cancer Treatment and Research Foundation

Guy-Paul Sanscartier, M.Sc., Fichier des tumeurs, ministère de la Santé
et des Services sociaux du Québec

John Silins, M.H.A., Bureau of Chronic Disease Epidemiology,
Laboratory Centre for Disease Control, Health and Welfare Canada

Managing Editors:

Leslie A. Gaudette, B.Sc., Canadian Centre for Health Information,
Statistics Canada

Eva M. Makomaski Illing, B.A., B.Ed., Canadian Centre for Health
Information, Statistics Canada

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INTRODUCTION

This monograph is published annually by the National Cancer Institute of Canada in collaboration with the Canadian Centre for Health Information (within Statistics Canada), Health and Welfare Canada and provincial cancer registries. The series began in 1987, and its development has benefitted 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 evaluation form is included on the final page of this report).

The main purpose of the publication is to provide health professionals, and others who have an interest in cancer, with an overview of the current incidence of, and mortality from, the more common types of cancer at the provincial and national levels. This constitutes the regular "core" of the monograph. In addition, and usually in response to requests from readers, special topics are included. This year's special topic is survival rates for cancer cases that were diagnosed in British Columbia.

Definitions of technical terms and details of how cancer sites were classified are provided in a **Glossary**.

Information on cancer incidence and mortality comes from the provincial 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, but in addition, estimated values for 1992 are also presented. The estimates for 1992 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. Details of the statistical methods used to produce the projections are described in the Methodologic Appendix. **It is important to emphasize that the figures provided for 1992 are estimates, rather than actual data.**

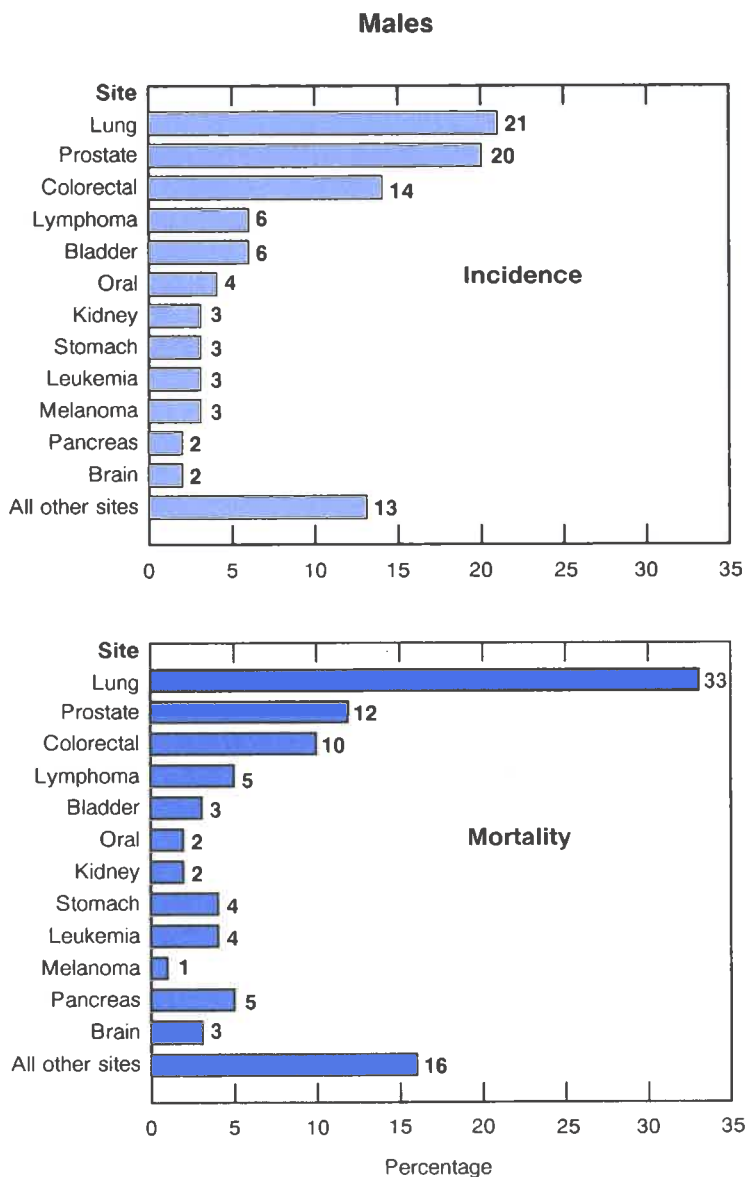
HIGHLIGHTS

- There has been a steady fall in the mortality rate for childhood cancer, 50% over the past 20 years, despite a gradual increase in incidence over that period. Much of the fall in mortality is due to improved treatment of leukemia and lymphoma in children.
- In the late 1980's, incidence and mortality rates for lung cancer among men began to plateau, likely reflecting the fall in tobacco consumption among men which began in the mid-1960's.
- In adults, incidence and mortality rates for cancers of the stomach, cervix, uterine body and ovary have been falling steadily for the past 15 to 20 years.
- In adults, mortality rates for colorectal cancer, testicular cancer and Hodgkin's Disease have declined over the past 20 years despite a stable or increased incidence rate. This reflects improved survival rates.
- In Canada, it is estimated that in 1992, 115,000 new cases of cancer will be diagnosed, with the number of new cases increasing by about 3,000 per year. The estimated number of cancer deaths is 58,300.
- In 1992, lung cancer will be the most common cancer among Canadian men. It is expected to be responsible for 21% of all new cancer cases and 33% of all cancer deaths. The other leading cancers among men include prostate cancer, colorectal cancer, the lymphomas and bladder cancer (Figure 1.1)
- In 1992 among Canadian women, breast cancer will be the most common cancer. It is expected to account for 28% of incident cancer cases and 20% of cancer deaths. The other major cancers among women include colorectal cancer, lung cancer, cancer of the uterine body and the lymphomas (Figure 1.2).
- Geographic analyses of incidence rates show higher rates in Quebec for cancers of the tongue, mouth, pharynx, lung and bladder (likely related to the higher levels of tobacco use in that province), a relatively high rate of stomach cancer in Newfoundland (consistent with the greater use of salted and smoked foods) and higher rates of melanoma of the skin in Ontario and British Columbia (possibly related to variations in exposure to sunlight).
- Incidence and mortality rates for breast cancer appear to have increased modestly during the late 1980's. Breast cancer remains the leading cause of cancer deaths for Canadian women, although in 1992, lung cancer is expected to exceed breast cancer as the leading cause of cancer death among women in some provinces, notably British Columbia.

- The lifetime probability of developing cancer (all cancers combined) of 38% for men and 36% for women indicates that over one in three Canadians will develop some form of cancer (other than non-melanoma skin cancer) during their lifetime.
- Of the more common cancers, one in ten women will develop breast cancer, while one in eleven men will develop prostate cancer. Lung cancer will occur in one in twenty-five women and one in eleven men, while one in sixteen Canadians will develop colorectal cancer. These cancers are clearly important targets for prevention programs.
- In 1989, cancer was the leading cause of potential years of life lost with diseases of the heart a close second.
- Between 1981 and 1987, the incidence of all cancers increased by 1% per year among men and 0.7% per year among women. The corresponding trends in mortality between 1981 and 1989 were an annual increase of 0.6% among men and 0.5% among women. Over the past 20 years, incidence and mortality rates have increased steadily for prostate cancer, lung cancer among women, and melanoma and kidney cancer in both sexes.
- From 1980 to 1984 in British Columbia, the relative survival for women, at 54% five years after diagnosis, was higher than for men (at 45%). This difference was due primarily to the greater incidence among men of cancers with very poor survival rates, such as lung cancer. Between the periods 1970 to 1974 and 1980 to 1984, the relative survival rates for most cancers improved. However three cancers with poor survival – stomach, lung and pancreatic cancer, showed little improvement.

Figure 1.1

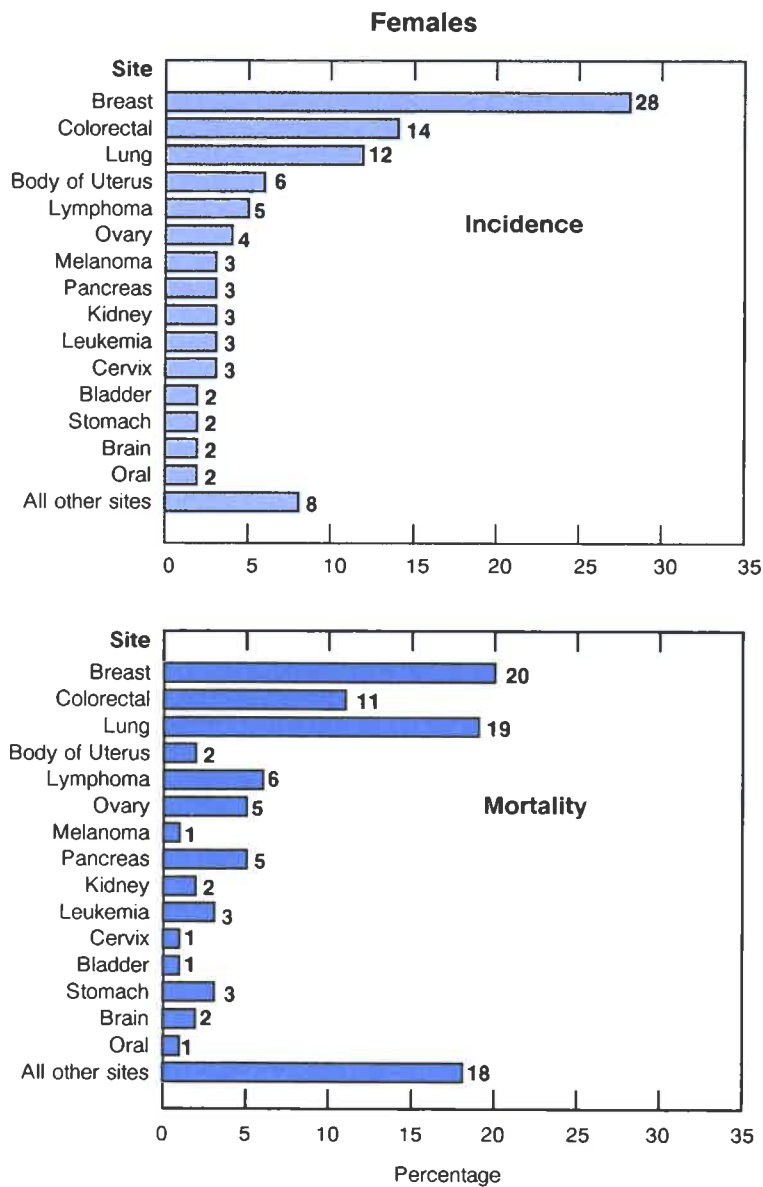
Percent Distribution of Estimated New Cases and Deaths for Major Cancer Sites, Canada, 1992



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: Canadian Centre for Health Information, Statistics Canada.

Figure 1.2
Percent Distribution of Estimated New Cases and Deaths for Major
Cancer Sites, Canada, 1992



Note: Excludes non-melanoma skin cancer (ICD-9 173).
Source: Canadian Centre for Health Information, Statistics Canada.

CURRENT INCIDENCE AND MORTALITY

Table 1 shows three measures of the current importance of the different types of cancer in Canada. The first is the **incidence**, expressed as the number of new cases of a given type of cancer diagnosed per year. The second is the **mortality**, expressed as the number of deaths attributed to the particular type of cancer during the year. The third is the ratio of the number of deaths to the number of new cases, which is a crude indicator of disease severity, with a value of 1.0 being an indication of very poor prognosis. As mentioned previously, the frequencies listed in Tables 1 to 6 are **estimates** based on extrapolations from previous years, and are rounded to the nearest 5, 10 or 100. It is also important to mention some of the problems and refinements inherent in statistics of this kind.

The incidence figures are collected by the provincial cancer registries. 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 ascertain for each case the site and histological type of cancer from pathology and other records. Cancer sites are defined using the Ninth Revision of the International Classification of Diseases (ICD-9), according to the site groupings listed in the **Glossary**. Although the provincial cancer registries strive, through the Canadian Council of Cancer Registries, to achieve uniformity in defining and classifying new cases, the procedures do differ across the country. This is especially true for cancer of the skin, other than melanoma, which occurs frequently but is difficult to register completely, and it is for this reason that **all the tables in this monograph exclude non-melanoma skin cancer**.

The provincial cancer incidence data are brought together by Statistics Canada to form the National Cancer Incidence Reporting System. These data are also included in the series entitled **Cancer Incidence in Five Continents**, which is produced by the International Agency for Research on Cancer(6).

Mortality statistics are derived from the death records maintained by the provincial registrars of vital statistics. The deaths counted in these tables are those that are attributed to some form of cancer as the underlying cause of death, based on the statement of cause of death by the certifying physician. 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.

With these reservations, we can estimate from Table 1 that 115,000 new cases of cancer will be diagnosed in Canada this year, and that 58,300 deaths will be attributed to cancer. Males outnumber females for both cases and deaths, as shown by sex ratios (male/female) of 1.10 for incidence and 1.23 for deaths. Three types of cancer account for 55% of the new cases in each sex: lung, prostate and colorectal cancers in males, and breast, colorectal and lung cancers in females. A third of the cancer deaths in males are due to lung cancer. Breast cancer still exceeds lung cancer in terms of female deaths but the gap is narrowing, especially in Nova Scotia, Manitoba, Saskatchewan and British Columbia.

The ratio of deaths to cases was 51% overall, being slightly greater in males than females. In terms of these ratios, the sites listed in Table 1 fall into three groups: those with a very good prognosis (a ratio of 33% or less - breast, prostate, bladder, oral, melanoma, uterus, cervix); those with a fair prognosis (a ratio greater than 33% but less than 66% - colorectal, lymphoma, kidney, leukemia, ovary); and those with a poor prognosis (ratio greater than 66% - lung, stomach, pancreas, brain). The ratios for males and females within sites are generally quite similar. The overall ratio of deaths to cases of 51% would be considerably lower if non-melanoma skin cancer cases were included, because most cases with this disease are readily cured.

Table 1
Estimated New Cases and Deaths for Major Cancer Sites, Canada, 1992

Site	New Cases 1992 Estimate			Deaths 1992 Estimate			Deaths/Cases ratio 1992 Estimate		
	Total	M	F	Total	M	F	Total	M	F
All Cancers	115,000	60,200	54,800	58,300	32,100	26,200	0.51	0.53	0.48
Lung	19,300	12,800	6,500	15,700	10,700	5,000	0.81	0.84	0.77
Colorectal	16,200	8,500	7,700	6,300	3,300	3,000	0.39	0.39	0.39
Female Breast	15,700	...	15,700	5,200	...	5,200	0.33	...	0.33
Prostate	12,000	12,000	...	3,700	3,700	...	0.31	0.31	...
Lymphoma	6,400	3,500	2,900	3,050	1,600	1,450	0.48	0.46	0.50
Bladder	5,100	3,800	1,300	1,270	890	380	0.25	0.23	0.29
Kidney	3,600	2,100	1,500	1,300	790	510	0.36	0.38	0.34
Oral	3,210	2,300	910	1,090	790	300	0.34	0.34	0.33
Leukemia	3,200	1,800	1,400	2,040	1,150	890	0.64	0.64	0.64
Melanoma	3,100	1,550	1,550	540	320	220	0.17	0.21	0.14
Body of Uterus	3,100	...	3,100	600	...	600	0.19	...	0.19
Stomach	3,000	1,900	1,100	2,190	1,400	790	0.73	0.74	0.72
Pancreas	2,900	1,400	1,500	2,850	1,450	1,400	0.98	1.04	0.93
Ovary	2,100	...	2,100	1,300	...	1,300	0.62	...	0.62
Brain	2,030	1,150	880	1,430	810	620	0.70	0.70	0.70
Cervix	1,450	...	1,450	380	...	380	0.26	...	0.26
All other sites	12,610	7,400	5,210	9,360	5,200	4,160	0.74	0.70	0.80

Note: Figures exclude an estimated 47,200 new cases of non-melanoma skin cancer (ICD-9 173).
... not applicable.

Source: Canadian Centre for Health Information, Statistics Canada.

Table 2
Estimated Population, New Cases and Deaths for All Cancers, Canada
and Provinces, 1992

Province	Population 1992 Estimate ¹ (thousands)	New Cases 1992 Estimate ^{2,3}			Deaths 1992 Estimate ³		
		Total	M	F	Total	M	F
Canada⁴	27,258.1	115,000	60,200	54,800	58,300	32,100	26,200
Newfoundland	575.8	1,770	950	820	1,030	600	430
Prince Edward Island	132.8	580	310	270	290	180	110
Nova Scotia	904.8	4,100	2,200	1,900	2,250	1,200	1,050
New Brunswick	729.9	3,350	1,850	1,500	1,560	880	680
Quebec	6,902.8	27,700	15,000	12,700	15,900	9,100	6,800
Ontario	10,088.0	44,800	23,000	21,800	21,600	11,700	9,900
Manitoba	1,103.3	4,900	2,500	2,400	2,450	1,350	1,100
Saskatchewan	1,000.9	4,150	2,200	1,950	2,080	1,200	880
Alberta	2,559.8	8,300	4,200	4,100	4,100	2,200	1,900
British Columbia	3,260.0	15,500	8,100	7,400	7,000	3,700	3,300
Yukon	26.9	40	20	20	25	15	10
Northwest Territories	55.8	70	40	30	45	20	25

¹ 1992 population projections have been provided by the Census and Demographic Statistics Branch, Statistics Canada.

² Figures exclude an estimated 47,200 new cases of non-melanoma skin cancer (ICD-9 173).

³ Data for Yukon and Northwest Territories are based on averages of the most recent 5 years for which data are available.

⁴ Canada totals exclude data for Yukon and Northwest Territories; totals may not add due to rounding.

Source: Canadian Centre for Health Information, Statistics Canada.

GEOGRAPHIC PATTERNS OF CANCER OCCURRENCE

Table 2 presents estimates for 1992 of populations, new cases and deaths for all sites of cancer combined, by sex and by province or territory. In this and subsequent tables, the figures for Canada do not include the values for the Yukon and Northwest Territories because estimates were not available regarding site-specific cancer occurrence for these jurisdictions.

For each province and for each specific type of cancer, the number of new cases, as estimated for 1992, is shown in Table 4. Estimates of the age-standardized incidence rates presented in Table 5, which adjust for differences between the size and age distribution of each province's population, make inter-provincial comparisons possible. The standard population used to standardize the rates is included in the **Glossary**. Tables 6 and 7 present data in a similar way for the number of deaths and for age-standardized mortality rates, respectively.

Readers have previously asked whether the observed inter-provincial differences in the rates for a particular type of cancer can be explained by the variation in the prevalence of known risk factors for that cancer site. Three potential problems should be considered prior to examining such associations. First, due to the rarity of some forms of cancer, the number of cases occurring in some provinces during a one year period may be so small that the resultant rate estimates may be highly variable. In order to avoid this potential problem, geographic patterns shown in Table 3 were identified on the basis of actual data for a five year period (1978-1982), as published in **Cancer Incidence in Five Continents**, Volume V(6). Second, correlations between the incidence of disease and the prevalence of risk factors in geographical areas can be misleading, and for a true association between a factor and a disease to be established it is necessary to perform more detailed studies of individual subjects. Third, for many cancers there is a long interval between exposure to a risk factor and the occurrence of disease, and information on the prevalence of risk factors in previous decades is often lacking.

Table 3 describes the geographic patterns of incidence rates for several cancer sites. The pattern of higher rates of lip cancer in the Atlantic and Prairie provinces is consistent with reports of an association with fishing and farming occupations. The pattern of higher rates in Quebec for cancers of the tongue, mouth and pharynx, the lung and the bladder, are consistent with higher levels of tobacco use in that province. The relatively high rates of stomach cancer in Newfoundland are consistent with the greater use of salted and smoked foods. The rates of melanoma of the skin are relatively high in Ontario and British Columbia, which may be consistent with the variation in sunlight exposure. Rates of cancer of the breast and female reproductive organs have been relatively low in the Atlantic provinces, which may be related to the high level of fertility in that region. Table 3 also shows that for cancers of the pancreas and kidney, which have been shown to be associated with cigarette smoking, there was not a concordant geographic pattern in incidence rates. The apparent geographic pattern for prostate cancer, brain cancer and the lymphomas cannot be readily attributed to known risk factor patterns.

Table 3
Geographic Patterns of Cancer Occurrence

Cancer site	Pattern of Incidence
Geographic pattern consistent with known risk factors:	
Oral cancer:	
– lip	higher in Atlantic region and Prairies
– tongue, mouth and pharynx	highest in Quebec (males)
Stomach	highest in Newfoundland
Lung	highest in Quebec (males)
Melanoma of skin	higher in Ontario and B.C. (both sexes)
Breast, Ovary, Body of Uterus	lower in Atlantic region
Bladder	higher in Quebec and Ontario
Geographic pattern not explained by known risk factors:	
Pancreas	little variation
Prostate	increasing east to west
Kidney	little variation
Brain	low in Atlantic region, high in Ontario
Lymphoma	low in Newfoundland

Table 4
Estimated New Cases for Major Cancer Sites, by Sex, Canada and Provinces, 1992

	New Cases										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	60,200	950	310	2,200	1,850	15,000	23,000	2,500	2,200	4,200	8,100
Lung	12,800	220	70	470	420	4,000	4,400	520	400	750	1,550
Prostate	12,000	160	60	420	380	2,600	4,200	570	460	880	2,300
Colorectal	8,500	160	45	340	250	2,100	3,400	340	350	580	1,000
Bladder	3,800	65	20	150	120	1,000	1,650	150	160	250	240
Lymphoma	3,500	50	15	100	120	780	1,450	150	130	250	490
Oral	2,300	70	15	65	65	500	930	100	90	170	300
Kidney	2,100	25	10	80	75	530	790	65	85	180	240
Stomach	1,900	60	10	75	40	570	680	80	80	95	220
Leukemia	1,800	15	10	45	45	430	740	80	85	120	230
Melanoma	1,550	10	5	60	35	170	760	45	55	130	290
Pancreas	1,400	15	10	55	30	350	550	55	50	110	170
Brain	1,150	15	5	35	40	290	440	45	40	95	160
Females											
All Cancers	54,800	820	270	1,900	1,500	12,700	21,800	2,400	1,950	4,100	7,400
Breast	15,700	230	75	510	390	3,700	5,900	610	560	1,300	2,300
Colorectal	7,700	130	45	310	240	1,950	3,000	350	270	420	940
Lung	6,500	60	25	230	150	1,600	2,600	280	200	440	960
Body of Uterus	3,100	50	15	85	100	730	1,150	130	85	280	470
Lymphoma	2,900	35	15	90	100	650	1,200	150	120	180	340
Ovary	2,100	30	10	65	55	370	880	60	85	180	330
Melanoma	1,550	15	10	65	50	190	700	45	65	120	280
Kidney	1,500	30	5	60	55	410	570	45	55	130	150
Pancreas	1,500	15	10	55	50	380	530	60	70	110	220
Cervix	1,450	50	10	55	40	230	570	70	60	130	140
Leukemia	1,400	5	10	40	40	320	650	55	50	95	150
Bladder	1,300	25	5	45	35	350	550	65	65	80	95
Stomach	1,100	15	5	45	40	360	340	55	50	65	140
Oral	910	20	5	25	15	140	410	40	40	95	120
Brain	880	30	—	30	35	200	370	30	20	60	100

Note: Totals may not add due to rounding and exclude non-melanoma skin cancer (ICD-9 173). Due to changes and improvements in source data and methodology, the 1992 estimates are not directly comparable to estimates published in previous years. Please refer to methodological appendix for further details. These estimates may vary from actual figures by about 5 to 15 percent. Provincial cancer registries may be contacted for the most current actual data.

— Less than 5 cases.

Source: Canadian Centre for Health Information, Statistics Canada.

Table 5
Estimated Age-Standardized Incidence Rates for Major Cancer Sites, by
Sex, Canada and Provinces, 1992

	Rate per 100,000										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	341	279	305	332	373	343	349	317	291	288	338
Lung	73	66	73	72	86	92	66	67	54	52	63
Prostate	63	42	42	53	67	56	59	63	50	57	91
Colorectal	49	47	41	51	50	47	51	42	43	41	40
Bladder	21	17	20	22	24	23	24	19	20	17	9
Lymphoma	21	16	16	17	25	18	23	21	19	17	22
Oral	14	20	17	12	14	12	15	14	13	12	14
Leukemia	12	5	11	8	10	11	12	11	13	8	12
Stomach	11	17	11	13	8	13	10	10	9	6	9
Kidney	12	8	11	13	17	12	13	8	12	13	10
Pancreas	8	3	9	9	6	8	8	6	6	8	7
Melanoma	9	1	6	10	8	4	12	5	9	9	14
Brain	7	3	4	7	11	7	8	7	7	7	8
Females											
All Cancers	266	236	232	255	265	231	285	262	251	257	282
Breast	77	64	71	71	75	72	82	69	79	85	94
Colorectal	34	34	35	36	34	32	35	31	29	22	30
Lung	31	18	16	28	29	31	33	34	27	29	35
Body of Uterus	16	15	14	13	18	14	15	15	10	19	18
Lymphoma	15	11	13	13	18	12	16	16	14	11	13
Ovary	10	9	15	10	11	7	12	6	12	12	13
Melanoma	9	5	7	9	10	4	10	7	10	8	13
Leukemia	7	3	7	6	7	6	9	7	4	6	6
Pancreas	6	4	7	6	7	6	6	5	7	6	7
Bladder	5	6	4	5	5	6	6	6	8	4	3
Kidney	8	8	11	7	10	8	8	5	7	8	6
Cervix	8	14	11	10	8	4	8	8	11	9	6
Brain	5	7	2	5	7	4	6	4	2	4	5
Stomach	5	4	3	6	7	5	4	4	4	4	4
Oral	5	5	2	3	1	3	5	3	5	5	5

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are adjusted to the age distribution of the World Standard Population. Due to changes and improvements in source data and methodology, the 1992 estimates are not directly comparable to estimates published in previous years. Please refer to methodological appendix for further details. These estimates may vary from actual figures. Provincial cancer registries may be contacted for their most current actual data.

Source: Canadian Centre for Health Information, Statistics Canada.

Table 6
Estimated Deaths for Major Cancer Sites, by Sex, Canada and
Provinces, 1992

	Deaths										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	32,100	600	180	1,200	880	9,100	11,700	1,350	1,200	2,200	3,700
Lung	10,700	190	60	390	320	3,500	3,700	410	350	640	1,150
Prostate	3,700	70	25	150	80	840	1,350	200	180	280	510
Colorectal	3,300	55	10	100	75	960	1,300	130	110	230	320
Lymphoma	1,600	25	10	45	55	430	590	85	65	130	200
Pancreas	1,450	20	10	55	30	420	520	55	35	120	170
Stomach	1,400	40	5	50	40	420	500	60	50	90	130
Leukemia	1,150	20	5	35	30	310	420	55	55	80	110
Bladder	890	15	--	35	30	240	340	40	35	40	110
Brain	810	15	5	20	15	210	310	25	35	70	120
Oral	790	10	5	20	10	240	320	35	25	40	80
Kidney	790	20	5	30	15	220	260	25	40	60	100
Melanoma	320	--	--	10	10	70	140	5	10	25	45
Females											
All Cancers	26,200	430	110	1,050	680	6,800	9,900	1,100	880	1,900	3,300
Breast	5,200	80	20	190	140	1,400	2,000	200	170	430	570
Lung	5,000	50	20	200	120	1,300	1,900	220	160	340	750
Colorectal	3,000	55	10	100	45	970	1,100	120	110	190	300
Lymphoma	1,450	15	5	45	40	380	560	70	55	90	170
Pancreas	1,400	20	10	50	35	380	520	50	50	110	180
Ovary	1,300	15	5	45	40	310	520	50	45	85	200
Leukemia	890	10	--	30	20	250	350	35	25	65	95
Stomach	790	20	5	25	25	220	270	40	30	55	100
Brain	620	15	5	25	15	170	230	20	20	45	80
Body of Uterus	600	10	--	15	20	210	200	20	25	40	60
Kidney	510	10	--	25	20	140	170	25	15	45	50
Cervix	380	5	5	25	5	70	170	25	15	35	40
Bladder	380	5	--	10	10	110	150	15	15	15	50
Oral	300	10	--	10	5	65	130	10	10	25	40
Melanoma	220	--	--	10	5	40	90	15	5	15	40

Note: Totals may not add due to rounding and exclude non-melanoma skin cancer (ICD-9 173). Estimates are calculated by extrapolating trends in cancer mortality as reported by provincial agencies. Due to changes and improvements in source data and methodology, the 1992 estimates are not directly comparable to estimates published in previous years. Please refer to methodological appendix for further details.

-- Less than 5 cases.

Source: Canadian Centre for Health Information, Statistics Canada.

Table 7
Estimated Age-Standardized Mortality Rates for Major Cancer Sites, by
Sex, Canada and Provinces, 1992

	Rate per 100,000										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	175	173	190	185	172	207	173	168	147	147	150
Lung	59	56	67	61	64	80	55	52	46	44	47
Colorectal	18	16	10	16	15	22	19	16	14	15	13
Prostate	18	19	19	20	13	18	18	20	18	18	18
Lymphoma	9	6	8	7	10	10	9	10	8	9	8
Pancreas	8	6	11	9	6	10	8	7	4	9	7
Stomach	7	11	2	8	8	9	7	7	6	6	5
Leukemia	6	6	7	6	6	8	6	7	8	5	5
Bladder	5	4	2	5	5	5	5	4	4	2	4
Oral	5	2	3	3	2	6	5	5	4	3	4
Brain	5	6	7	4	4	5	5	4	5	5	5
Kidney	4	6	5	5	3	5	4	3	6	4	4
Melanoma	2	—	1	1	2	2	2	1	1	2	2
Females											
All Cancers	113	111	89	130	109	115	115	110	98	109	111
Breast	25	21	19	26	25	25	26	21	20	28	21
Lung	24	15	19	28	22	24	23	25	21	21	27
Colorectal	11	12	5	9	6	15	11	10	10	10	9
Lymphoma	6	4	4	6	6	6	6	6	5	5	5
Ovary	6	5	7	5	6	5	6	5	6	5	7
Pancreas	5	4	2	5	5	6	5	4	5	6	6
Leukemia	4	2	2	4	3	4	4	3	2	3	3
Stomach	3	5	2	2	4	3	3	3	3	3	3
Brain	3	4	4	3	3	4	3	2	2	3	3
Body of Uterus	2	2	1	2	3	3	2	1	2	2	2
Cervix	2	2	1	4	—	1	2	3	2	2	2
Kidney	2	2	—	3	3	2	2	2	1	3	1
Melanoma	1	—	1	—	1	1	1	—	1	1	1
Bladder	1	1	1	—	1	2	1	1	1	—	1
Oral	1	2	—	1	1	1	1	1	1	1	1

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are calculated by extrapolating trends in cancer mortality as reported by provincial agencies. Due to changes and improvements in source data and methodology, the 1992 estimates are not directly comparable to estimates published in previous years. Please refer to methodological appendix for further details.

-- Estimated ASMR less than 0.5 per 100,000.

Source: Canadian Centre for Health Information, Statistics Canada.

AGE AND SEX DISTRIBUTION OF CANCER

The following tables present results pertaining to the most recent year for which actual rather than estimated data are available for all of Canada, which for new cases is 1987 and for deaths is 1989. Table 8 shows that about two thirds of cancer deaths in both sexes and a similar proportion of new cases in males occur in the elderly (65 years and older); comparable figures for those under 45 years of age are 4% to 6% for deaths among males and females, respectively. This pattern is somewhat different for new cases among females, as only half occur in those 65 and older, because of the relatively high incidence at a younger age of tumours that have a reasonably good prognosis, such as cancers of the breast and the reproductive organs.

Annual age-specific rates of cancer incidence and mortality are plotted in Figure 2. The rate of cancer incidence rises steeply with age in both sexes. The relationship is not quite exponential with age, in fact for many types of cancer, incidence rises exponentially with the logarithm of age. As previously noted, incidence rates are higher in females than in males up to age 55, after which the sex ratio changes. This is due to the high incidence rates for cancers of the breast and reproductive organs in younger females, and the higher incidence rates of most types of cancer in older males. Similar patterns are apparent with regard to mortality, as age-specific rates rise sharply, especially in males, after age 55.

For each sex, the specific cancer sites are presented in greater detail, with Table 9 showing the actual number of new cases in 1987, and Table 10 showing the actual number of deaths in 1989.

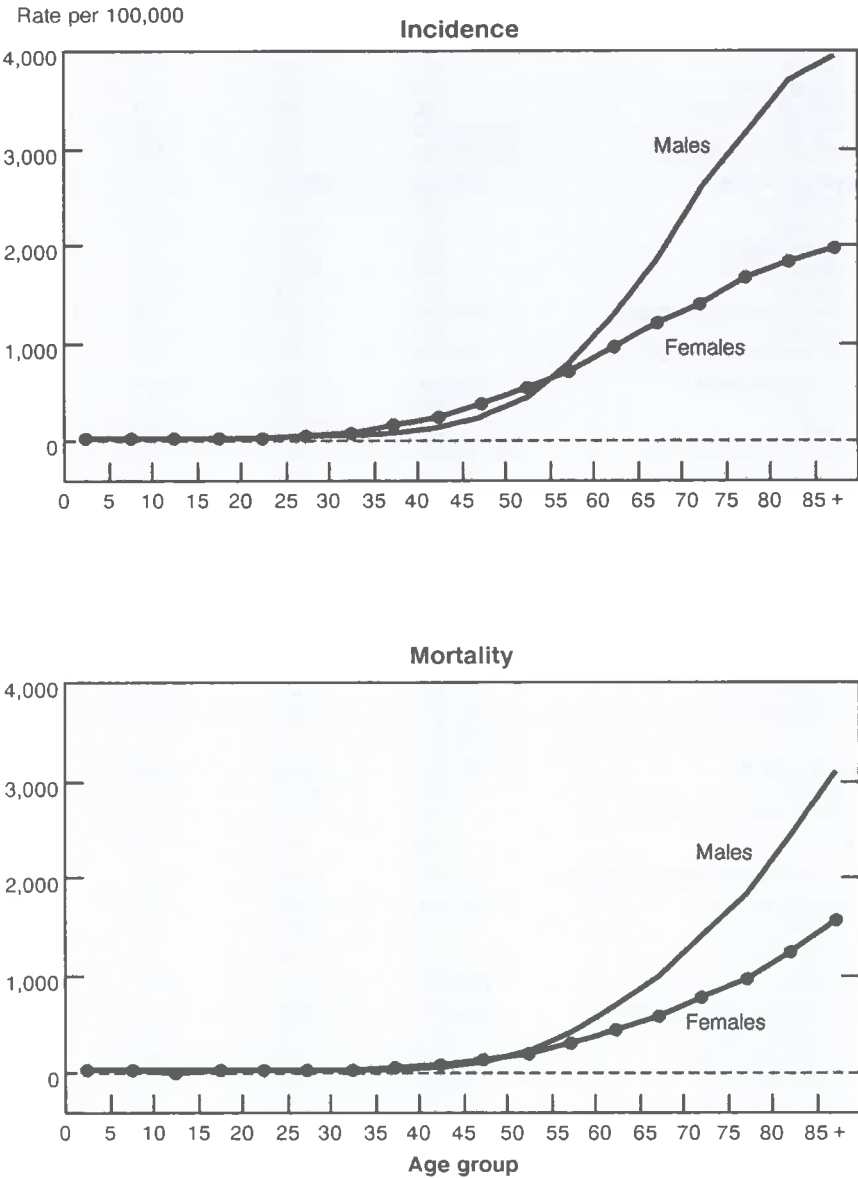
Table 8
Percent Distribution of New Cases of Cancer (1987) and Cancer Deaths (1989), by Age Group and Sex, Canada

Age Group	New Cases (1987)						Deaths (1989)					
	Total		Males		Females		Total		Males		Females	
	#	%	#	%	#	%	#	%	#	%	#	%
0-44	9,925	10	4,011	8	5,914	13	2,582	5	1,182	4	1,400	6
45-54	10,144	11	4,313	9	5,831	13	4,095	8	2,047	7	2,048	9
55-64	21,425	22	11,524	23	9,901	22	10,309	20	6,038	21	4,271	19
65-69	14,162	15	8,007	16	6,155	13	7,796	15	4,562	16	3,234	14
70-74	14,312	15	8,427	17	5,885	13	7,823	15	4,563	16	3,260	14
75-84	20,104	21	11,244	22	8,860	19	13,367	26	7,455	26	5,912	26
85 +	6,106	6	2,842	6	3,264	7	5,169	10	2,388	8	2,781	12
All ages	96,253	100	50,413	100	45,840	100	51,141	100	28,235	100	22,906	100

Note: Incidence data include 75 new cases of cancer with age not stated. Figures include data from Yukon and Northwest Territories and exclude non-melanoma skin cancer (ICD-9 173). Percentages have been calculated using the total number of new cases and deaths due to cancer, and may not add due to rounding.

Source: Canadian Centre for Health Information, Statistics Canada.

Figure 2
Age-Specific Incidence (1987) and Mortality (1989) Rates for All Cancers, by Sex, Canada



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: Canadian Centre for Health Information, Statistics Canada.

Table 9
New Cases of Cancer, by Site and Sex, Canada, 1987

Site	ICD-9	Total	Males	Females
All cancer sites	140-208	96,253	50,413	45,840
Oral (Buccal cavity and pharynx)	140-149	2,837	2,041	796
Lip	140	704	600	104
Tongue	141	489	333	156
Salivary gland	142	231	124	107
Floor of the mouth	144	256	181	75
Pharynx	146,147,148	695	506	189
Other and unspecified	143,145,149	462	297	165
Digestive organs	150-159	22,577	12,040	10,537
Esophagus	150	947	691	256
Stomach	151	3,041	1,891	1,150
Small intestine	152	250	132	118
Large intestine	153	9,226	4,396	4,830
Rectum	154	4,495	2,628	1,867
Liver and biliary passages	155,156	1,490	739	751
Pancreas	157	2,603	1,301	1,302
Other and unspecified	158,159	525	262	263
Respiratory system	160-165	17,088	12,071	5,017
Larynx	161	1,248	1,039	209
Lung	162	15,303	10,688	4,615
Other and unspecified	160,163-165	537	344	193
Bone tissue and skin	170-172	3,275	1,639	1,636
Bone	170	299	167	132
Connective Tissue	171	603	332	271
Skin (melanoma)	172	2,373	1,140	1,233
Breast	174,175	12,404	97	12,307
Genital organs	179-187	16,496	10,005	6,491
Cervix uteri	180	1,392	...	1,392
Corpus uteri	182	2,712	...	2,712
Ovary	183	1,872	...	1,872
Prostate	185	9,263	9,263	...
Other and unspecified	179,181,184, 186,187	1,257	742	515
Urinary organs	188-189	7,118	4,886	2,232
Bladder	188	4,473	3,344	1,129
Kidney and other urinary	189	2,645	1,542	1,103
Eye	190	237	125	112
Brain and central nervous system	191-192	1,780	1,005	775
Endocrine glands	193-194	1,092	341	751
Thyroid	193	960	267	693
Other endocrine	194	132	74	58
Leukemia	204-208	2,915	1,687	1,228
Other blood and lymph tissues	200-203	5,366	2,916	2,450
Hodgkin's disease	201	775	438	337
Multiple myeloma	203	1,103	588	515
Other lymphomas	200,202	3,488	1,890	1,598
All other and unspecified sites	195-199	3,068	1,560	1,508

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases.
Figures include data from Yukon and Northwest Territories and exclude non-melanoma skin cancer (ICD-9 173).
... not applicable.

Source: Cancer in Canada, Standard Table 41018. Canadian Centre for Health Information, Statistics Canada.

Table 10
Cancer Deaths, by Site and Sex, Canada, 1989

Site	ICD-9	Total	Males	Females
All cancer sites	140-208	51,141	28,235	22,906
Oral (Buccal cavity and pharynx)	140-149	979	704	275
Lip	140	22	21	1
Tongue	141	200	138	62
Salivary gland	142	71	42	29
Floor of the mouth	144	36	24	12
Pharynx	146,147,148	282	216	66
Other and unspecified	143,145,149	368	263	105
Digestive organs	150-159	14,200	7,808	6,392
Esophagus	150	911	658	253
Stomach	151	2,210	1,371	839
Small intestine	152	105	52	53
Large intestine	153	4,378	2,214	2,164
Rectum	154	1,331	788	543
Liver and biliary passages	155,156	1,367	730	637
Pancreas	157	2,528	1,332	1,196
Other and unspecified	158,159	1,370	663	707
Respiratory system	160-165	14,106	9,986	4,120
Larynx	161	443	370	73
Lung	162	13,446	9,469	3,977
Other and unspecified	160,163-165	217	147	70
Bone tissue and skin	170-172	889	528	361
Bone	170	104	68	36
Connective Tissue	171	268	143	125
Skin (melanoma)	172	517	317	200
Breast	174,175	4,613	28	4,585
Genital organs	179-187	5,453	3,136	2,317
Cervix uteri	180	416	...	416
Corpus uteri	182	352	...	352
Ovary	183	1,205	...	1,205
Prostate	185	3,048	3,048	...
Other and unspecified	179,181,184, 186,187	432	88	344
Urinary organs	188-189	2,280	1,499	781
Bladder	188	1,171	827	344
Kidney and other urinary	189	1,109	672	437
Eye	190	38	18	20
Brain and central nervous system	191-192	1,267	715	552
Endocrine glands	193-194	194	85	109
Thyroid	193	117	50	67
Other endocrine	194	77	35	42
Leukemia	204-208	1,764	972	792
Other blood and lymph tissues	200-203	2,721	1,444	1,277
Hodgkin's disease	201	167	100	67
Multiple myeloma	203	829	446	383
Other lymphomas	200,202	1,725	898	827
All other and unspecified sites	195-199	2,637	1,312	1,325

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases.
Figures include data from Yukon and Northwest Territories, and exclude non-melanoma skin cancer (ICD-9 173).
... not applicable.

Source: Causes of Death, Vital Statistics Volume IV, Standard Table 41030, Canadian Centre for Health Information, Statistics Canada.

LIFETIME PROBABILITY OF DEVELOPING CANCER

For each cancer site, estimates of the probability that an individual Canadian will develop or die from a particular form of cancer over their whole lifespan (from birth to age 90) are listed in Table 11 and plotted in Figure 3. These estimates refer to a hypothetical situation in which cancer is the only cause of death and are based on the assumption that current incidence and mortality rates will be maintained(6). The lifetime probability of developing cancer (all cancers combined) of 38.4% for males and 35.7% for females indicates that over one in three Canadians will develop some form of cancer (other than non-melanoma skin cancer) during their lifetime. For several types of cancer, such as cancers of the breast in females, the prostate and lung in males and colon-rectum in both sexes, the lifetime probability of their development ranges between 5% and 10%, which makes these cancer sites important targets for prevention programs. The lifetime probability for other cancers was small, although not negligible, being less than 2% for most other sites. These probabilities could be compared with the lifetime probabilities for accidental death of 6% for males and 4% for females, and for a lifetime suicide probability of 1.4% for males and 0.6% for females.

Table 11
Lifetime Probability of Developing¹ and Dying² from Cancer

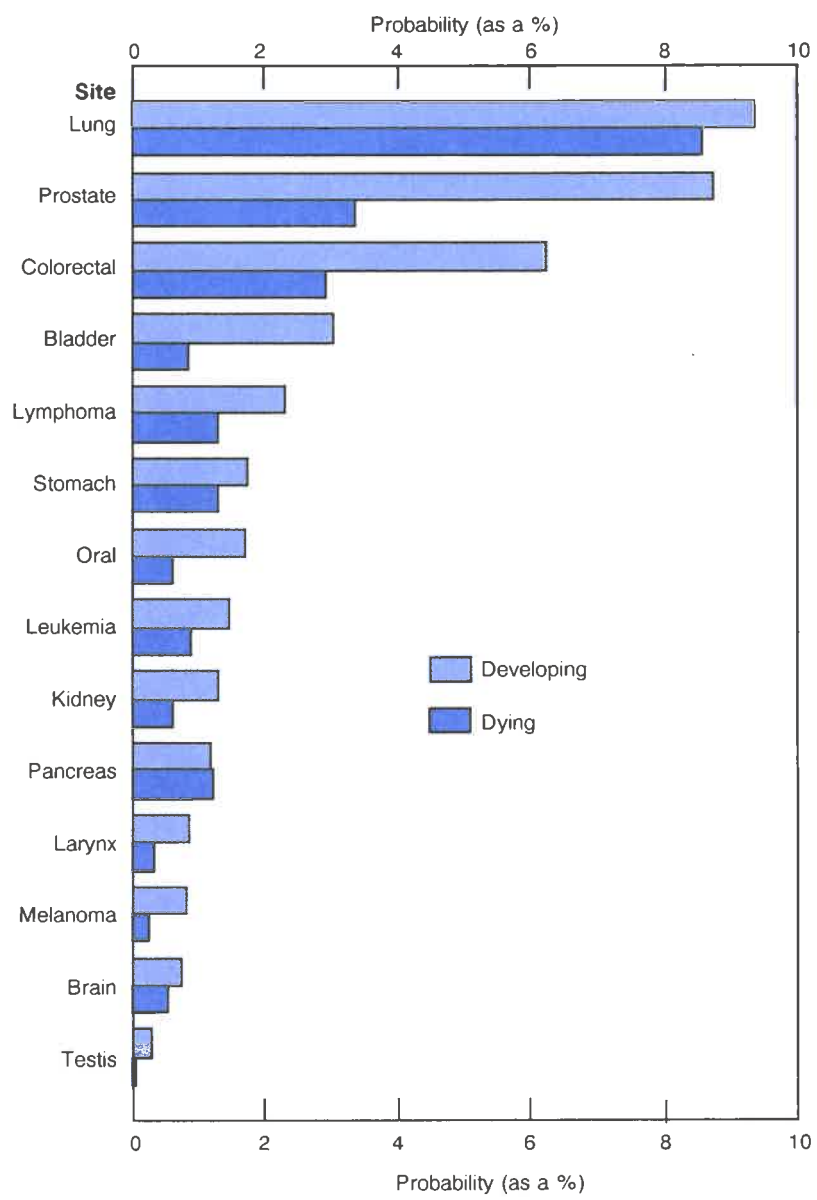
	Lifetime Probability of Developing Cancer (%)	Lifetime Probability of Dying from Cancer (%)
Males		
All Cancers	38.43	26.38
Lung	9.33	8.56
Prostate	8.75	3.33
Colorectal	6.24	2.88
Bladder	3.04	0.87
Lymphoma	2.33	1.29
Stomach	1.74	1.31
Oral	1.71	0.61
Leukemia	1.46	0.88
Kidney	1.30	0.60
Pancreas	1.20	1.22
Larynx	0.86	0.33
Melanoma	0.82	0.25
Brain	0.72	0.55
Testis	0.30	0.03
Females		
All Cancers	35.73	22.20
Female Breast	10.01	4.18
Colorectal	6.45	2.90
Lung	4.03	3.58
Body of Uterus	2.43	0.60
Lymphoma	2.12	1.26
Ovary	1.55	1.11
Pancreas	1.33	1.23
Stomach	1.18	0.88
Leukemia	1.15	0.78
Bladder	1.10	0.39
Cervix	0.97	0.35
Kidney	0.97	0.43
Melanoma	0.88	0.17
Oral	0.71	0.27
Brain	0.61	0.45
Larynx	0.17	0.07

¹ Based on 1987 data and calculated from birth to age 90.

² Based on 1989 data. See Methodological Appendix for details.

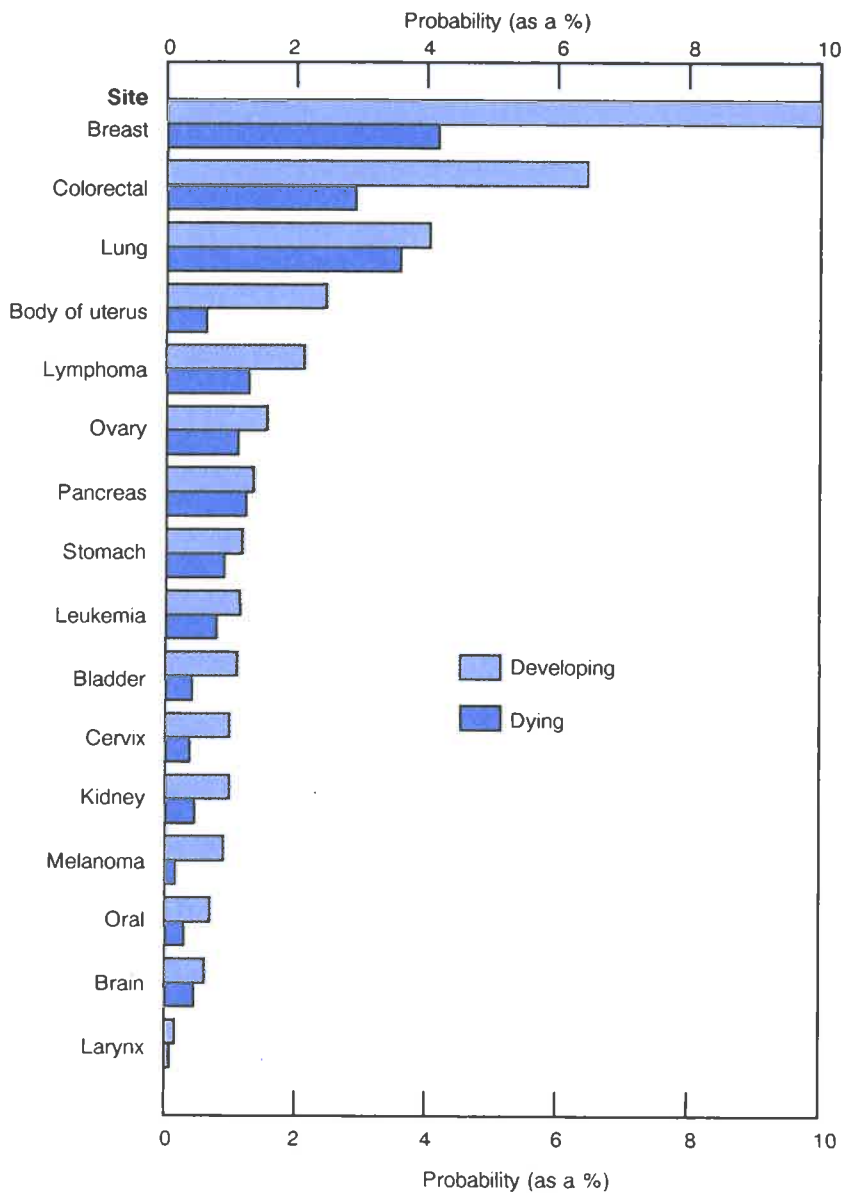
Source: Bureau of Chronic Disease Epidemiology, Health and Welfare Canada.

Figure 3.1
Lifetime Probability of Developing¹ and Dying²
from Cancer, Males, Canada



¹ Based on 1987 data and calculated from birth to age 90.
² Based on 1989 data.
Source: Bureau of Chronic Disease Epidemiology, Health and Welfare Canada.

Figure 3.2
Lifetime Probability of Developing¹ and Dying²
from Cancer, Females, Canada



¹ Based on 1987 data and calculated from birth to age 90.

² Based on 1989 data.

Source: Bureau of Chronic Disease Epidemiology, Health and Welfare Canada.

POTENTIAL YEARS OF LIFE LOST DUE TO CANCER

Figure 4 shows that in 1989, cancer was the leading cause of loss of years of life, as measured by potential years of life lost (PYLL), while diseases of the heart were a close second. In children (ages 0-14), cancer ranked fifth as a cause of PYLL, following perinatal causes, congenital anomalies, other accidents and motor vehicle accidents.

Table 12 presents estimates of the PYLL due to cancer, which were calculated by first subtracting the age at death of each victim from the expectation of life at that age, and then summing these differences for all individuals who died from cancer in a given year. The annual toll of over three quarters of a million potential years of life lost is enormous. Lung cancer, breast cancer and colorectal cancer account for about half of lost potential life.

Although more males than females die from cancer every year, females generally live longer than males and many of the cancer deaths among females occur at younger ages, for example, those due to cancers of the breast and female reproductive organs. Consequently, the PYLL due to cancer is slightly higher in females (399,000) than in males (387,000).

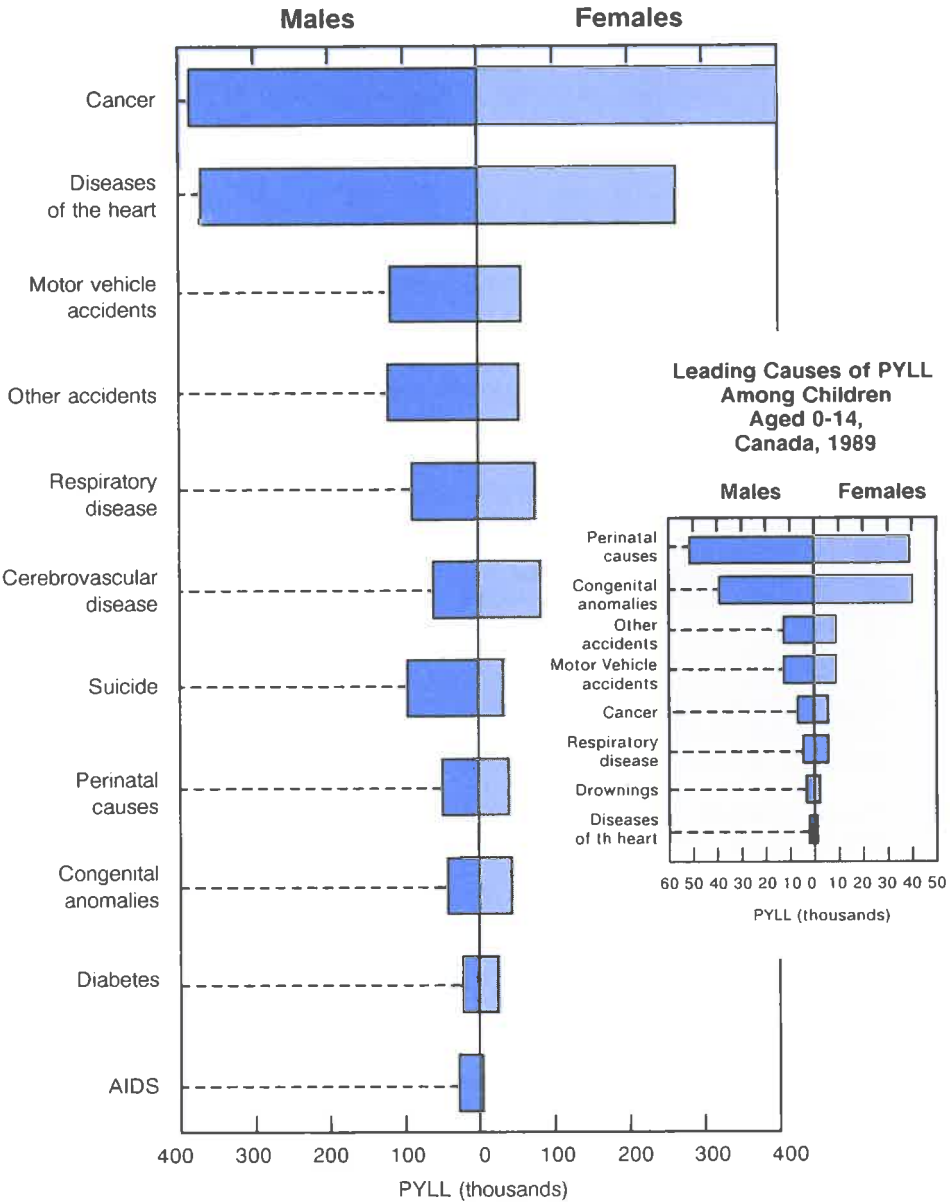
Table 12
Potential Years of Life Lost Due to Cancer, Canada, 1989

Site	Potential Years of Life Lost (PYLL)					
	Total		Males		Females	
	Years	%	Years	%	Years	%
All cancers	786,000	100.00	387,000	100.00	399,000	100.00
Lung	202,000	25.65	129,000	33.30	73,000	18.21
Female Breast	91,000	11.52	...	...	91,000	22.71
Colorectal	77,000	9.72	38,000	9.84	38,000	9.60
Lymphoma	45,000	5.66	23,000	6.01	21,000	5.32
Pancreas	35,000	4.50	18,000	4.68	17,000	4.32
Leukemia	34,000	4.26	17,000	4.50	16,000	4.02
Brain	30,000	3.80	16,000	4.23	14,000	3.39
Stomach	30,000	3.76	17,000	4.49	12,000	3.06
Prostate	27,000	3.47	27,000	7.05	...	...
Ovary	22,000	2.80	...	...	22,000	5.51
Kidney	17,000	2.20	10,000	2.59	7,000	1.82
Oral	16,000	1.98	11,000	2.82	5,000	1.16
Bladder	13,000	1.61	9,000	2.21	4,000	1.02
Melanoma	11,000	1.45	7,000	1.71	5,000	1.20
Cervix	10,000	1.25	...	...	10,000	2.47
Body of Uterus	8,000	1.03	...	...	8,000	2.04
Larynx	7,000	0.84	5,000	1.36	1,000	0.34
Testis	2,000	0.24	2,000	0.48	...	...

Note: Ranked in order of total PYLL for both sexes combined and based on life expectancy. Figures may not add due to rounding and exclude non-melanoma skin cancer (ICD-9 173).
... not applicable.

Source: Bureau of Chronic Disease Epidemiology, Health and Welfare Canada.

Figure 4
Leading Causes of Potential Years of Life Lost (PYLL),
Canada, 1989



Note: In descending rank order of the 10 leading causes (both sexes combined). AIDS is shown for comparison.

Source: Bureau of Chronic Disease Epidemiology, Health and Welfare Canada.

RELATIVE CANCER SURVIVAL

Survival rates provide the most direct indication of the severity of disease and the impact of cancer treatment. Population-based survival rates such as are presented here can be considered to be representative of the total cancer experience in a community. Changes in survival reflect a variety of factors, including improvements in treatment and care, and changes in diagnostic technology. Differences in overall survival among different populations reflect differences in incidence trends, health care systems, patient characteristics, and reporting methods; therefore it is difficult to compare rates from different populations.

The relative five year survival rates shown in Table 13 and Figures 5 and 6 are from the British Columbia Cancer Registry. In previous years survival rates from the Ontario, Alberta, and Saskatchewan registries have been presented.

All rates shown are **relative** survival rates. Relative survival rates were calculated by adjusting the observed survival rate according to the normal life expectancy in the general population. For example, a five-year relative survival rate of 49% in British Columbia males diagnosed with colorectal cancer in the period 1980-1984 means that a man diagnosed with colorectal cancer during that period is approximately half as likely to survive five years after his diagnosis as the general population of men in his age group.

As Table 13 demonstrates, although relative survival rates differ markedly among cancer types, the survival rate is generally higher for females than for males. From 1980 to 1984 in British Columbia, the relative survival for women, at 54% five years after diagnosis, was higher than for men (at 45%). This difference in prognosis is due primarily to the greater occurrence among males of cancers with low survival rates, such as lung cancer. However the table shows that this is not a complete explanation since, for cancer types that occur in both sexes, the survival rates are generally higher among females. An exception is bladder cancer, where the prognosis is slightly poorer in females.

Figure 5 demonstrates that, for most cancer types, the relative survival rate has improved between the periods 1970 to 1974 and 1980 to 1984. Three cancers with poor survival, stomach, lung, and pancreatic cancer, have shown very little improvement. For all types of cancer the relative survival rate for males has increased by 6 percentage points, while that for females has increased by half that amount (3 percentage points). Although the pattern of the changes for the sites common to both sexes is similar, the improvements for males are generally larger than for females. It is possible that this is simply a consequence of adjustment for mortality from other causes.

Figure 6 illustrates the relative survival rates for major cancer sites, by sex, at one, three, five, and ten years after diagnosis, for the period 1970 to 1988. As can be seen in the figure, for many types of cancer, a large proportion of excess deaths associated with a cancer diagnosis occur in the first year after diagnosis, and a much smaller proportion between five and ten years post-diagnosis. An exception is breast cancer, where the relative survival rate continues to decrease as long as twenty years after diagnosis.

Table 13
Relative Five Year Cancer Survival Rates for Major Cancer Sites, by
Time Period and Sex, British Columbia, 1970-1974 and 1980-1984

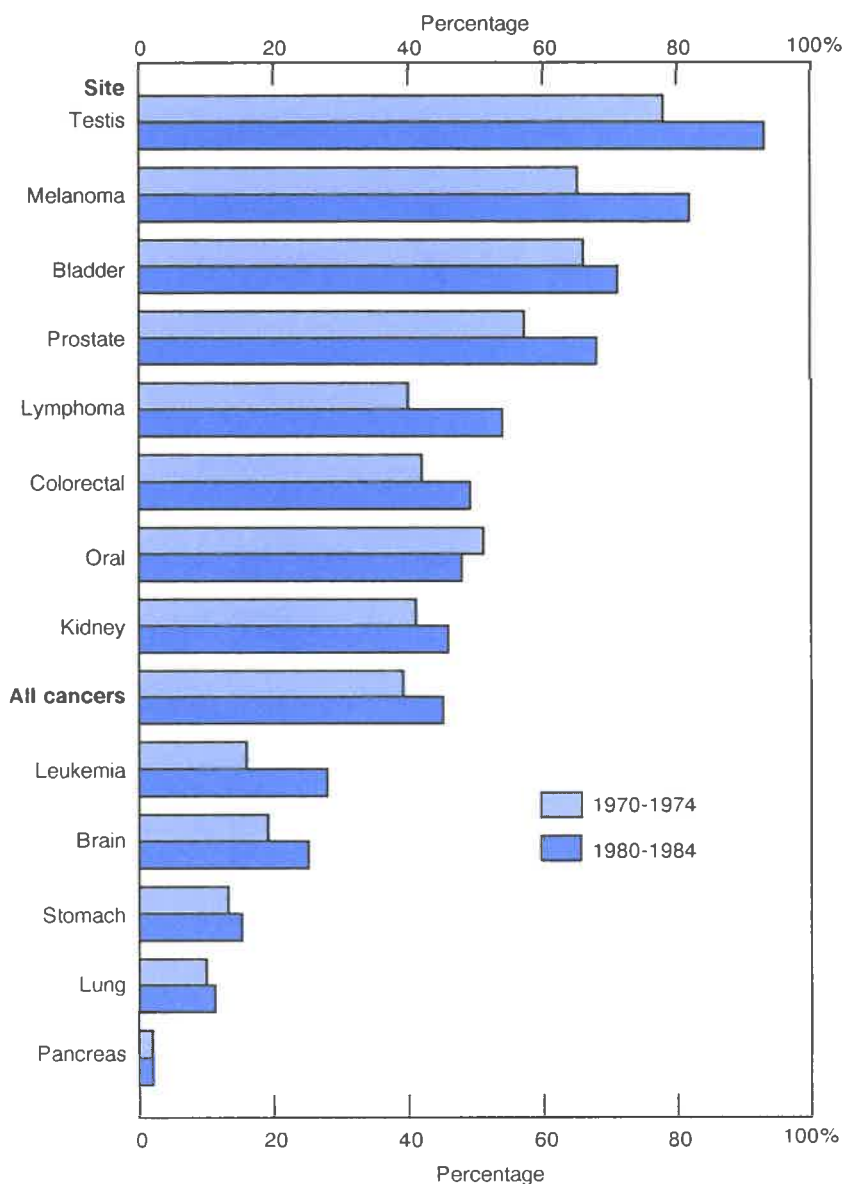
Relative Five Year Survival (%)					
Males	1970- 1974	1980- 1984	Females	1970- 1974	1980- 1984
All Cancers	39	45	All Cancers	51	54
Testis	78	93	Melanoma	80	88
Melanoma	65	82	Body of Uterus	82	82
Bladder	66	71	Cervix	68	74
Prostate	57	68	Breast	70	73
Lymphoma	40	54	Bladder	66	67
Colorectal	42	49	Oral	63	60
Oral	51	48	Kidney	42	50
Kidney	41	46	Colorectal	45	49
Leukemia	16	28	Lymphoma	50	56
Brain	19	25	Ovary	33	35
Stomach	13	15	Leukemia	19	31
Lung	10	11	Brain	25	25
Pancreas	2	2	Stomach	13	16
			Lung	12	14
			Pancreas	1	2

Note: Figures exclude non-melanoma skin cancer (ICD-9 173).

Source: British Columbia Cancer Agency.

Figure 5.1

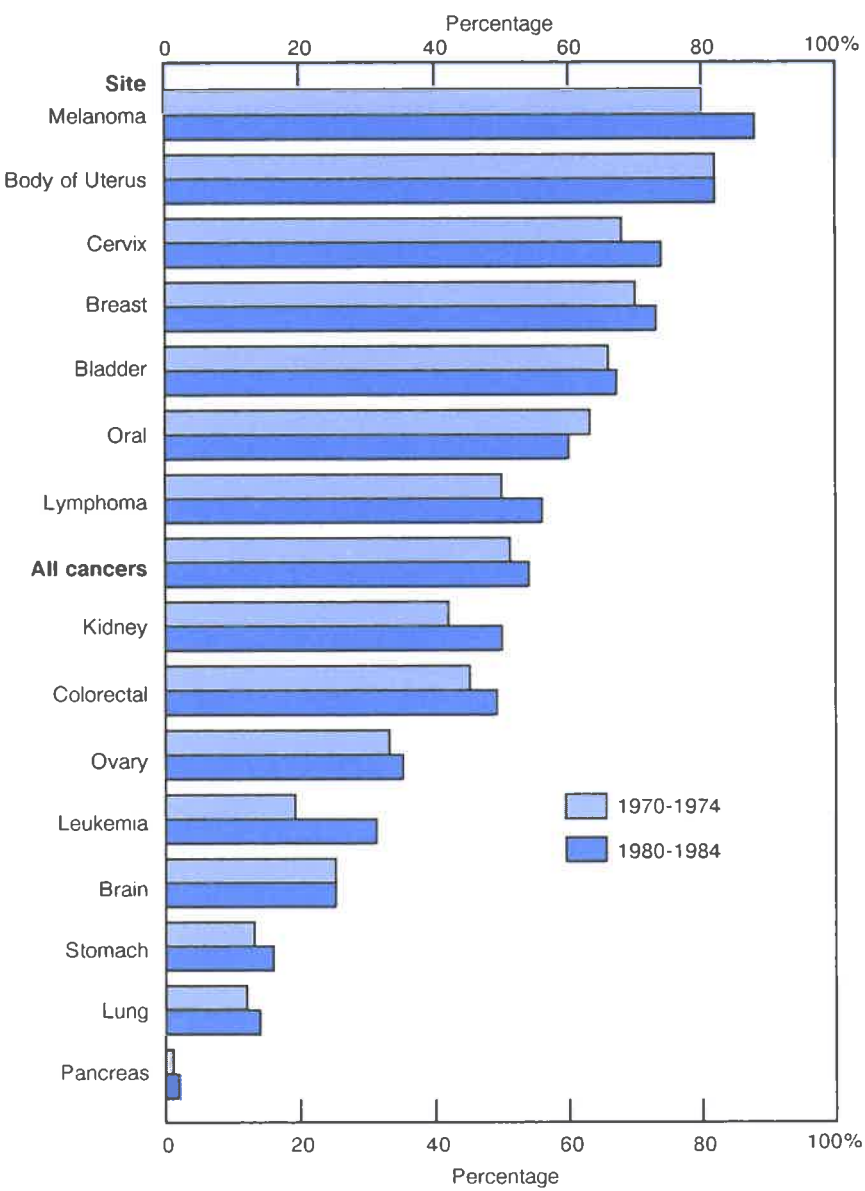
Relative Five Year Cancer Survival Rates for Major Cancer Sites, by Time Period, Males, British Columbia, 1970-1974 and 1980-1984



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: British Columbia Cancer Agency.

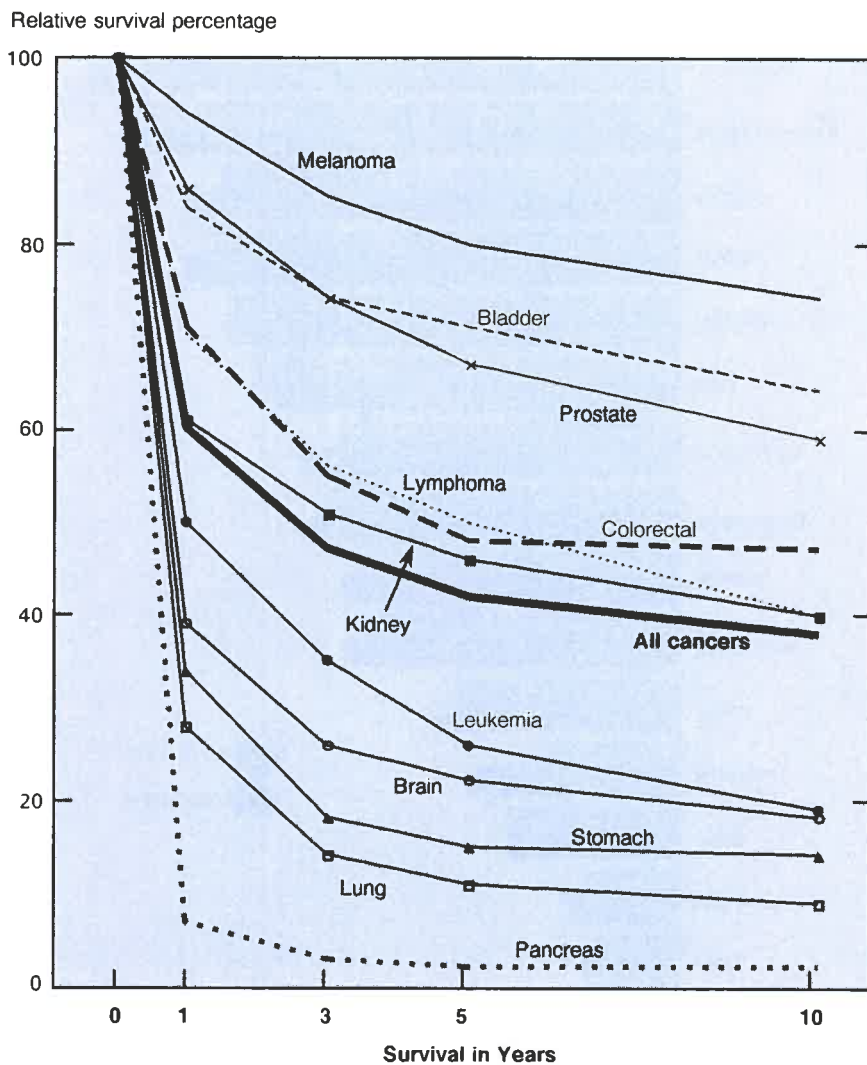
Figure 5.2
Relative Five Year Cancer Survival Rates for Major Cancer Sites, by
Time Period, Females, British Columbia, 1970-1974 and 1980-1984



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: British Columbia Cancer Agency.

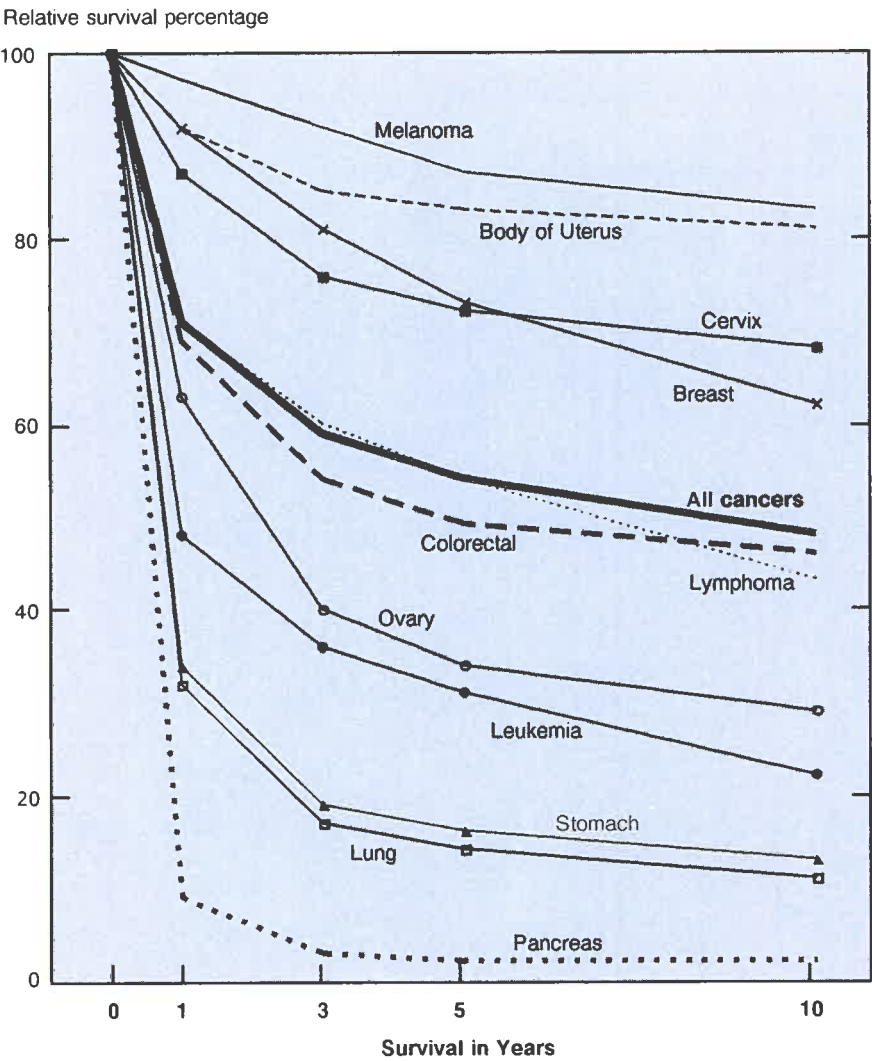
Figure 6.1
Relative Survival Rates for One, Three, Five and Ten Years for
Selected Cancer Sites, Males, British Columbia, 1970-1988



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: British Columbia Cancer Agency.

Figure 6.2
Relative Survival Rates for One, Three, Five and Ten Years for
Selected Cancer Sites, Females, British Columbia, 1970-1988



Note: Excludes non-melanoma skin cancer (ICD-9 173).

Source: British Columbia Cancer Agency.

TRENDS IN INCIDENCE AND MORTALITY

The recent trends in the incidence of, and mortality from, the major types of cancer were assessed by comparing annual age-standardized rates. The process of age-standardization permits comparisons between calendar years, since it takes account of changes that have occurred over time in the population size and the age distribution of the population.

The average annual percent changes in site-specific incidence and mortality rates over the period beginning in 1981 are listed in Table 14 and plotted in Figure 7. More detailed depictions of the trends in annual rates since 1970 are presented in Figures 8 to 13.

The incidence of all cancers combined increased by an average of 1.0 % per year in males and 0.7 % per year in females between 1981 and 1987 (Table 14). The corresponding trends in mortality between 1981 and 1989 were similar but less marked, as there was an annual increase of 0.6 % in males and 0.5 % in females (Table 14). Average annual changes in incidence and mortality for all cancers, calculated since 1981, are consistent with trends since 1970 (Figure 8).

Figure 9, which plots the percent change in mortality rates from year to year for all sites combined and for all sites excluding lung cancer, shows that lung cancer was responsible for the slight trend of increasing mortality rates for all cancer sites combined among males. Figure 9 indicates that for all sites other than lung cancer, mortality has been stable in males and decreasing in females.

Time trends in incidence and mortality rates for the major cancer sites are shown for males in Figures 10 and 11, while similar plots for females are presented in Figures 12 and 13. Data presented for specific cancer sites can be used to make inferences regarding whether the observed trends are due to changes in incidence or survival, and in some circumstances it is possible to speculate about the role of specific risk factors. Based on these trends, the cancer sites can be categorized in several ways. First, for cancers with stable incidence and mortality rates (e.g., changing less than 1% per year), such as cancers of the breast and pancreas in females, lung cancer in males, and oral cancer, bladder cancer, brain cancer and leukemia in both sexes, it can be concluded that there has been no change in either incidence or survival. Second, for cancers that have had increases in both incidence and mortality rates, which includes melanoma of the skin in females, kidney cancer in both sexes, and prostate cancer, it can be simply concluded that the incidence rate has been increasing. Third, the trend in cancers for which both incidence and mortality rates have been decreasing, which includes cancers of the stomach, cervix, uterus and ovary, would be due to a true decline in incidence rates. Fourth, for cancers that have a stable or increasing incidence rate but a decreasing mortality rate, which includes colorectal cancer, testicular cancer and Hodgkin's Disease, it can be inferred that survival rates have increased.

Some of these trends can be explained by the distribution of known risk factors, such as smoking (cancers of the lung and pancreas) or sunbathing (melanoma of the skin), by patterns of earlier diagnosis (cancer of the cervix), or by implementation of improved treatment (testicular cancer, Hodgkin's Disease). Trends which cannot be fully explained at present include the increasing incidence of brain cancer and lymphoma in males, and the decreasing incidence in cancer of the stomach in both sexes.

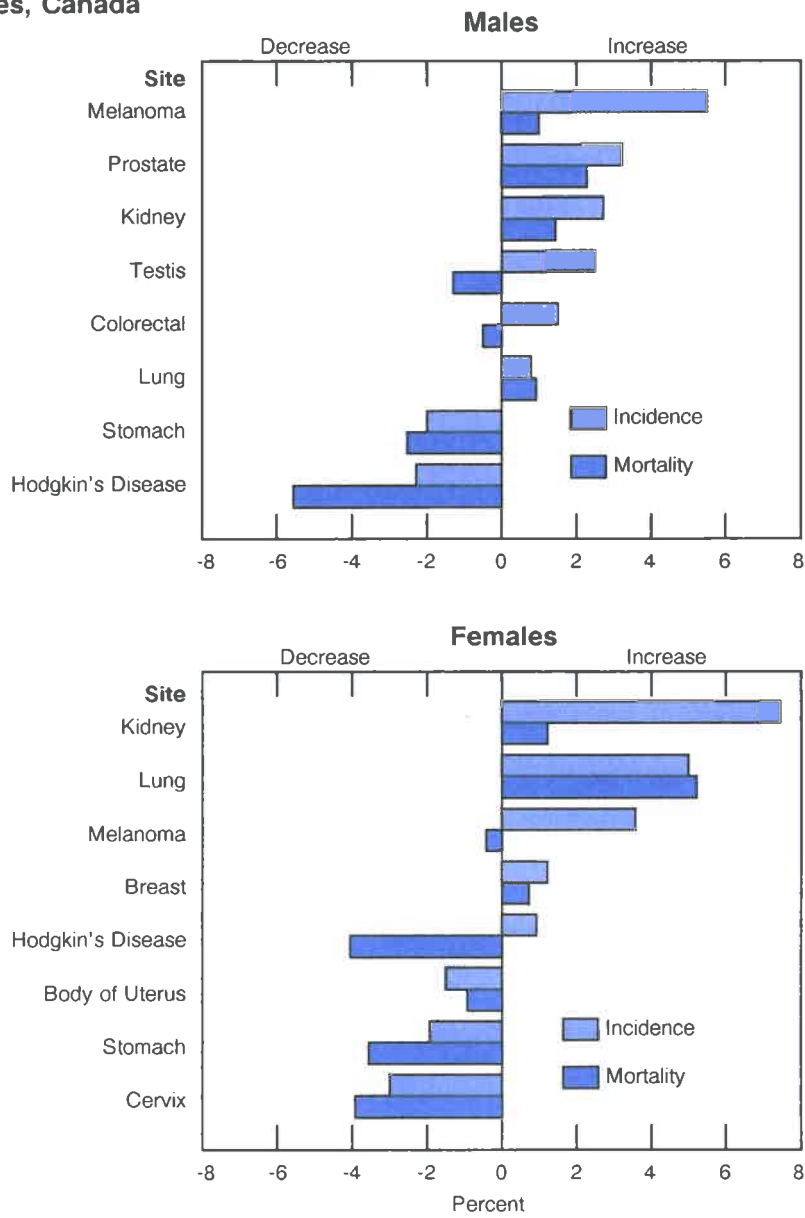
Table 14
Average Annual Percent Change in Age-Standardized Incidence (1981-1987) and Mortality (1981-1989) Rates for Selected Cancer Sites, Canada

Site	Incidence 1981-1987		Mortality 1981-1989	
	Males	Females	Males	Females
All Cancers	1.0	0.7	0.6	0.5
Oral	-0.6	0.3	0.6	-0.7
Stomach	-2.0	-1.9	-2.5	-3.6
Colorectal	1.5	0.2	-0.5	-1.8
Pancreas	-1.8	0.7	-1.3	-0.4
Lung	0.8	5.0	0.9	5.2
Melanoma	5.5	3.6	1.0	-0.4
Female Breast	...	1.2	...	0.7
Cervix	...	-3.0	...	-3.9
Body of Uterus	...	-0.8	...	-1.9
Ovary	...	-1.5	...	-0.9
Prostate	3.2	...	2.3	...
Testis	2.5	...	-1.3	...
Bladder	-0.1	-0.6	-0.8	-0.9
Kidney	2.7	7.4	1.4	1.2
Brain	0.5	-0.8	0.3	-0.7
Hodgkin's Disease	-2.3	0.9	-5.6	-4.1
Multiple Myeloma	0.1	1.1	1.0	0.5
Non-Hodgkin's Lymphoma	2.2	0.2	1.6	1.4
Leukemia	0.2	-0.3	-0.4	-0.9
All Childhood Cancers	Both sexes		Both sexes	
Age 0-14	1.9		-4.1	

Note: Average Annual Percent Change is calculated assuming a log linear model and excludes non-melanoma skin cancer (ICD-9 173).
... not applicable.

Source: Canadian Centre for Health Information, Statistics Canada.

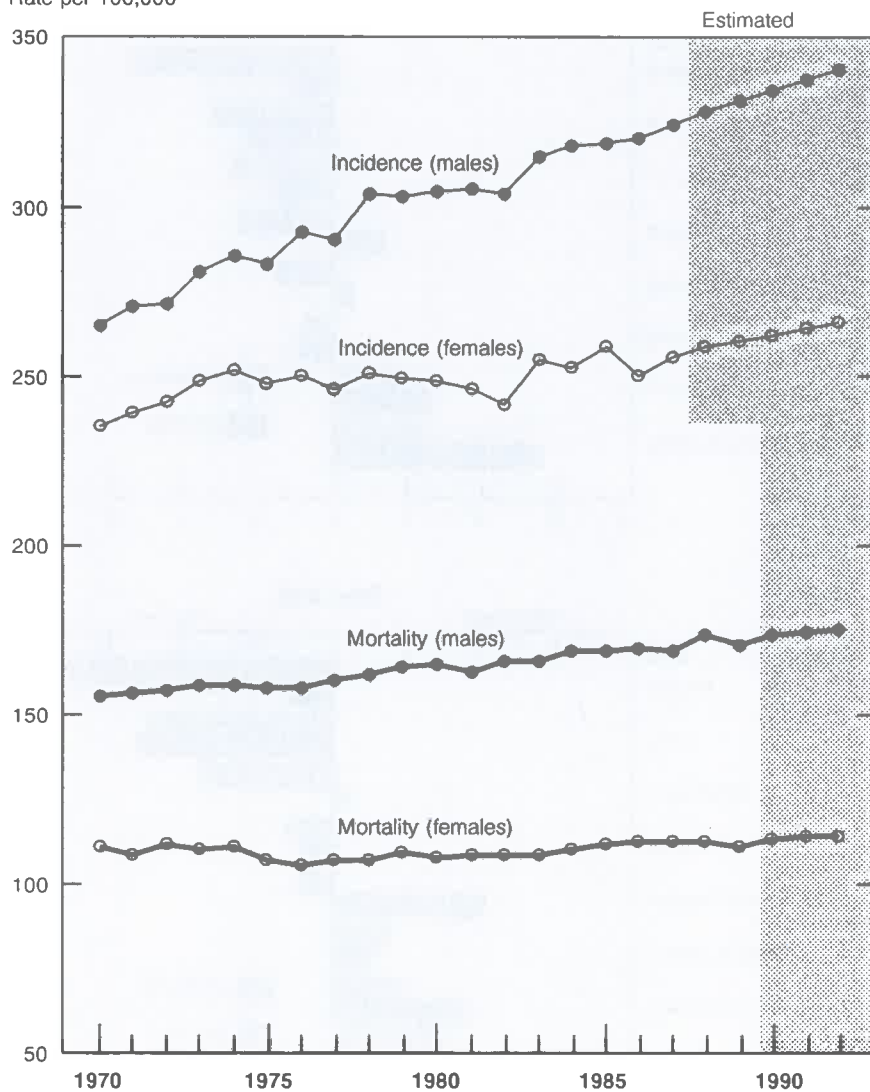
Figure 7
Average Annual Percent Change in Age-Standardized Incidence (1981-1987) and Mortality (1981-1989) Rates for Selected Cancer Sites, Canada



Note: See Table 14 for percentages for all sites.
Source: Canadian Centre for Health Information, Statistics Canada.

Figure 8
Age-Standardized Incidence and Mortality Rates for All Cancers,
Canada, 1970-1992

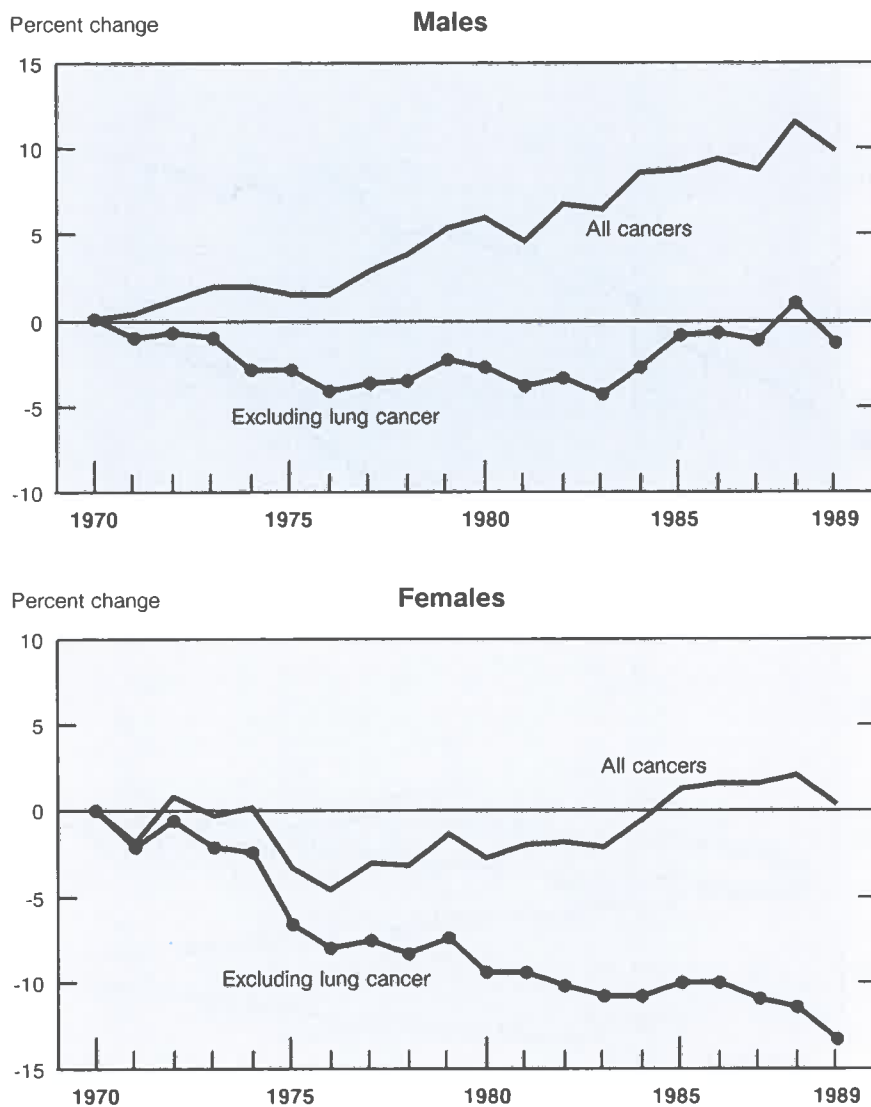
Rate per 100,000



Note: Rates are adjusted to the age distribution of the World Standard Population; all figures exclude non-melanoma skin cancer (ICD-9 173).

Source: Canadian Centre for Health Information, Statistics Canada.

Figure 9
Percent Change¹ in Age-Standardized Mortality Rates², Including and Excluding Lung Cancer, Canada, 1970-1989

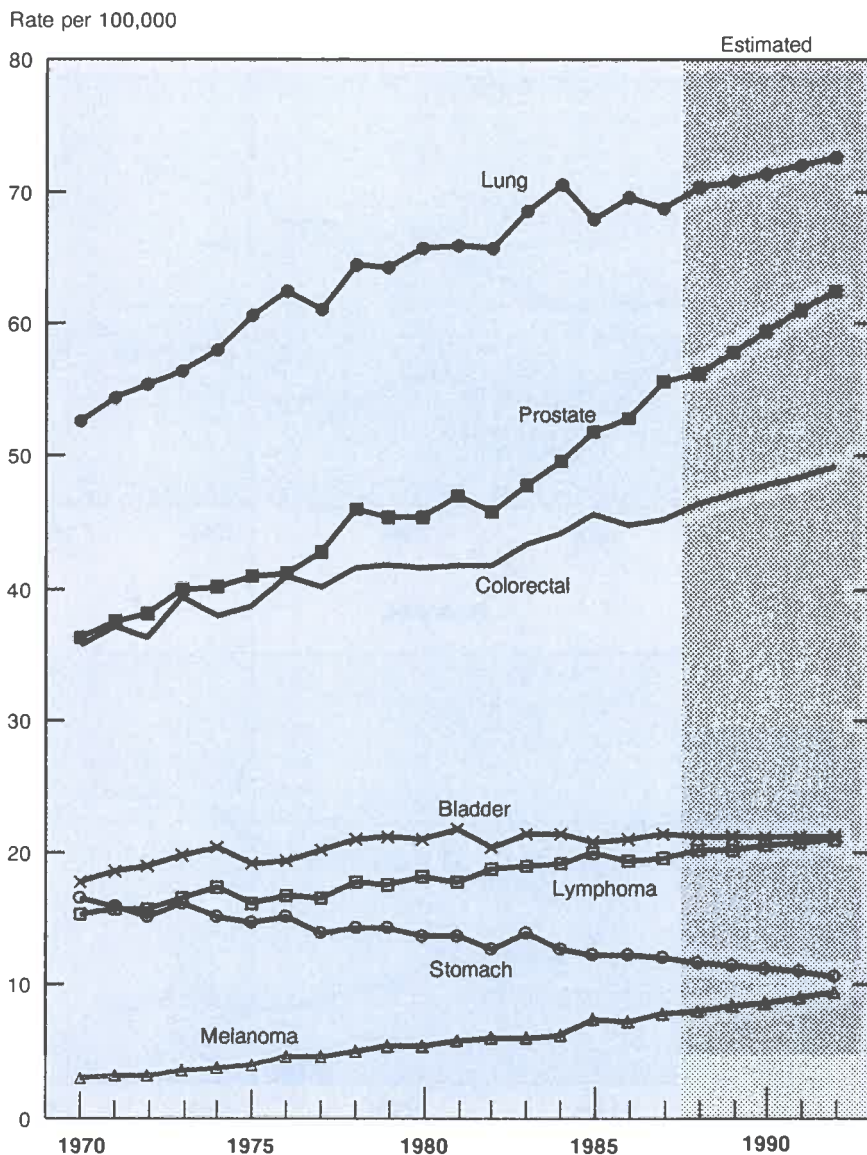


¹ Percent change is the percent difference between the annual and base year (1970) rate.

² Rates are adjusted to the age distribution of the World Standard Population;
all figures exclude non-melanoma skin cancer (ICD-9 173).

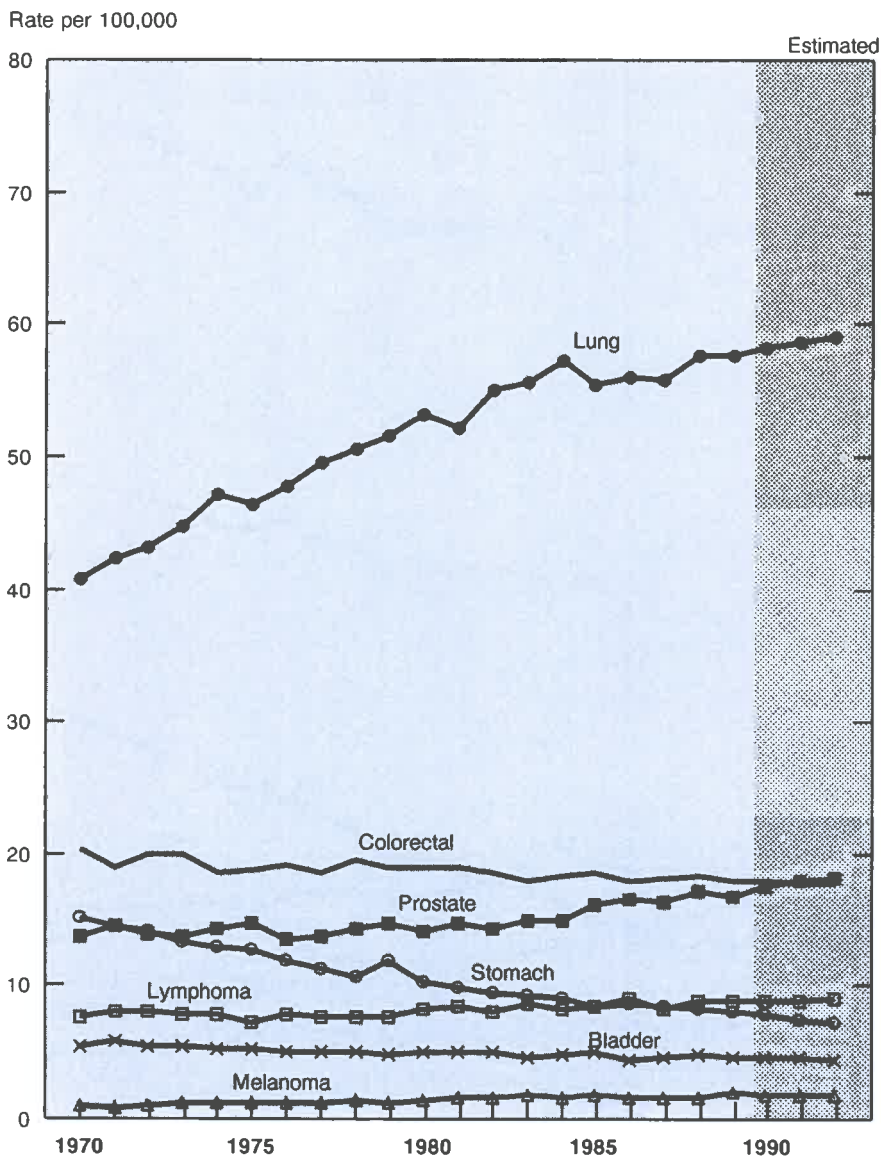
Source: Canadian Centre for Health Information, Statistics Canada.

Figure 10
Age-Standardized Incidence Rates for Selected Cancer Sites,
Males, Canada, 1970-1992



Note: Rates are adjusted to the age distribution of the World Standard Population.
Source: Canadian Centre for Health Information, Statistics Canada.

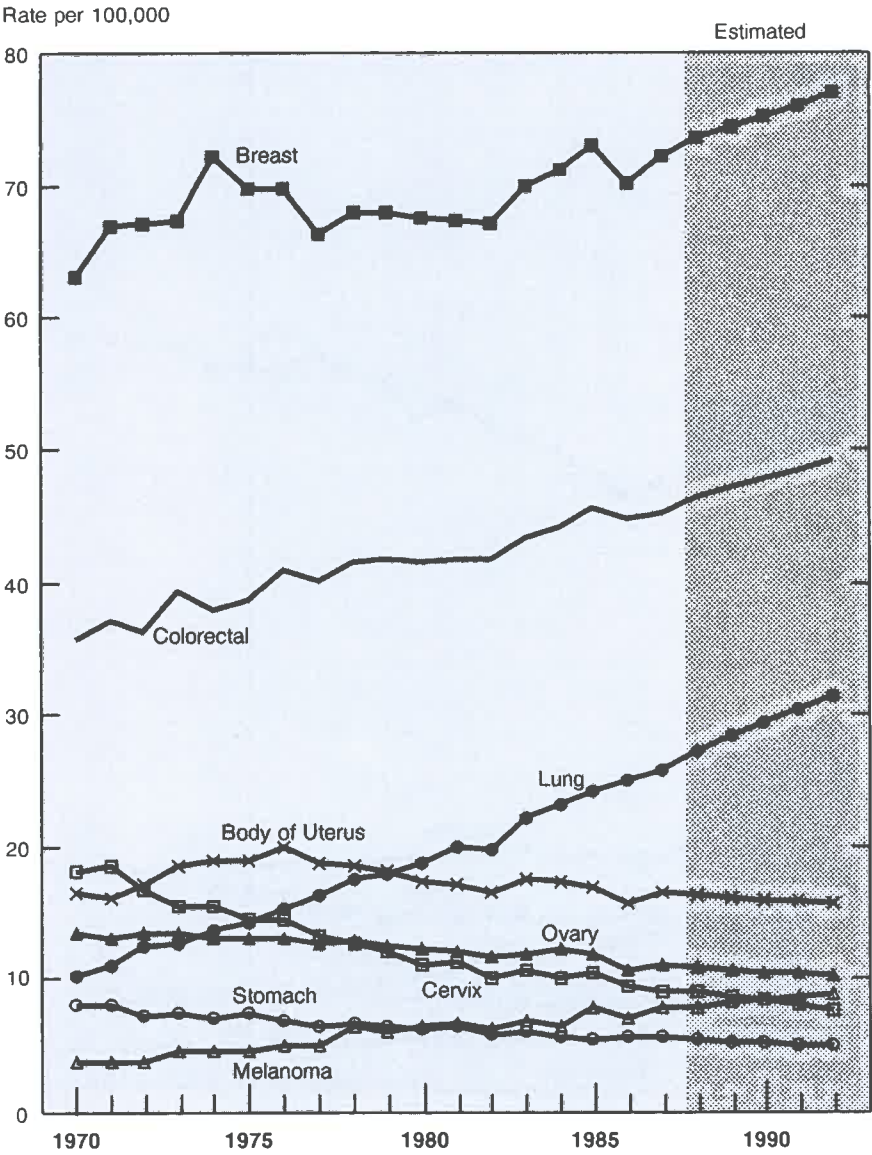
Figure 11
Age-Standardized Mortality Rates for Selected Cancer Sites,
Males, Canada, 1970-1992



Note: Rates are adjusted to the age distribution of the World Standard Population.

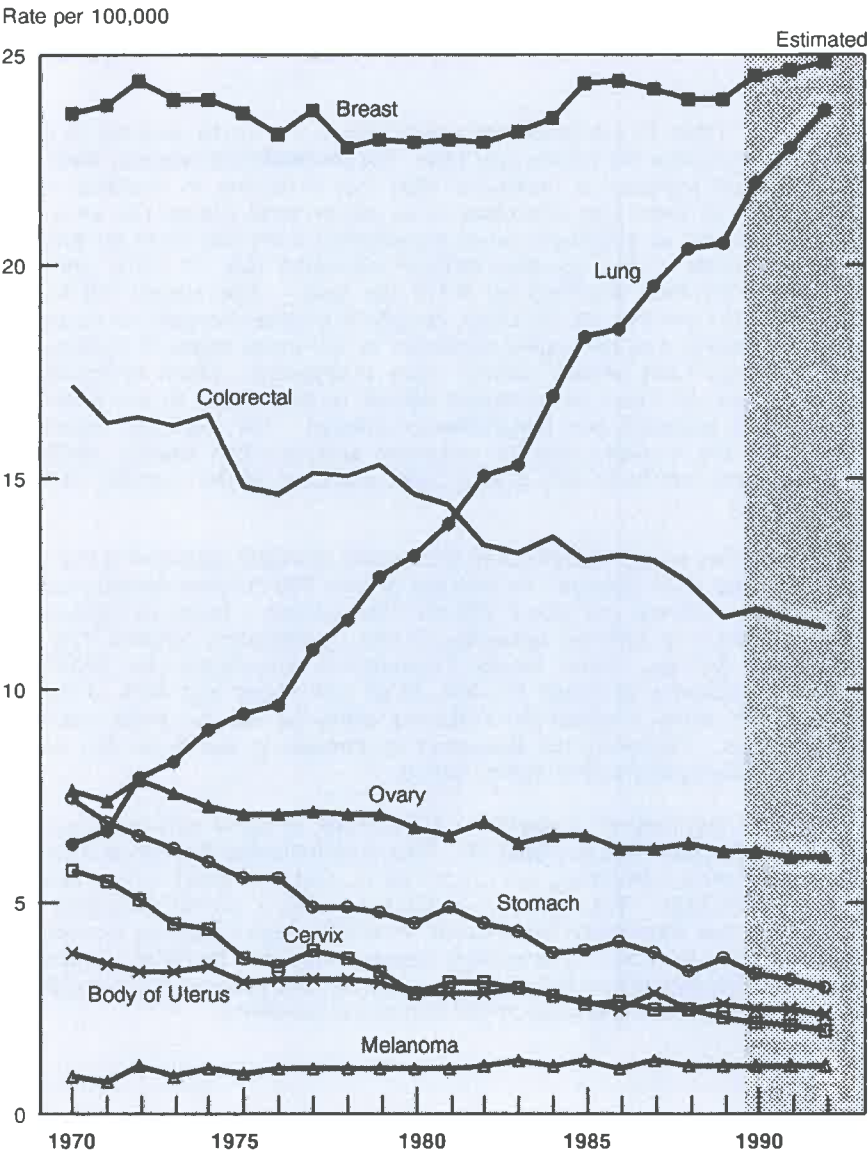
Source: Canadian Centre for Health Information, Statistics Canada.

Figure 12
Age-Standardized Incidence Rates for Selected Cancer Sites, Females, Canada, 1970-1992



Note: Rates are adjusted to the age distribution of the World Standard Population.
Source: Canadian Centre for Health Information, Statistics Canada.

Figure 13
Age-Standardized Mortality Rates for Selected Cancer Sites,
Females, Canada, 1970-1992



Note: Rates are adjusted to the age distribution of the World Standard Population.
Source: Canadian Centre for Health Information, Statistics Canada.

CANCER IN CHILDREN AGED 0-14

Table 15 lists annual age-standardized incidence and mortality rates for cancer among children (aged 0-14) in Canada since 1970. This table lists the rates for all cancers combined and for the two most frequently occurring types of cancer in children, namely, leukemia and brain cancer. Childhood cancer is a rare disease, as it affects about 16 of every 100,000 children in the population per year.

The data in Table 15 are presented graphically in Figure 14, in order to more clearly demonstrate the trends over time. For all childhood cancers, there has been a slight increase in incidence rates but a decline in mortality rates. These patterns were also described in an earlier table (Table 14), as it was reported that for all childhood cancers combined there has been an average annual increase in the age-standardized incidence rate of 1.9%, whereas mortality rates have declined by 4.1% per year. The steady fall in the mortality rate over the last 20 years, despite a gradual increase in incidence over that period, can be largely attributed to advances made in treating the disease which have caused survival rates to improve. Much of the fall in mortality from all forms of childhood cancer is attributable to the improved treatment of leukemia and lymphoma in children. For example, Figure 14 shows that the mortality rate for childhood leukemia has steadily declined, whereas there has been only a very slight reduction in the mortality rate for brain cancer.

Table 16 shows recent childhood incidence and mortality data over a five year period and for all of Canada. An average of over 900 children develop cancer each year in Canada and about 230 die from cancer. Table 16 reports the types of cancer in children according to the classification scheme that was established by the World Health Organization specifically for childhood cancers. Leukemia accounts for 30% of all new cases and 40% of cancer deaths, with acute lymphocytic leukemia being by far the most common specific type. Following the leukemias in frequency, are brain and spinal cancers, the lymphomas and kidney cancer.

The ratio of the number of deaths to the number of cases can be calculated from the data presented in Table 16. This ratio indicates that for all types of childhood cancer combined, the prognosis is relatively good with a ratio of 25% (1,136/4,522). The types of malignancy with a poorer prognosis are leukemias other than acute lymphocytic leukemia, neuroblastoma, tumours of the brain other than astrocytoma, liver cancer and some forms of lymphoma. Given the treatments that are currently available, the prognosis for Hodgkin's disease, retinoblastoma and germ-cell tumours is excellent.

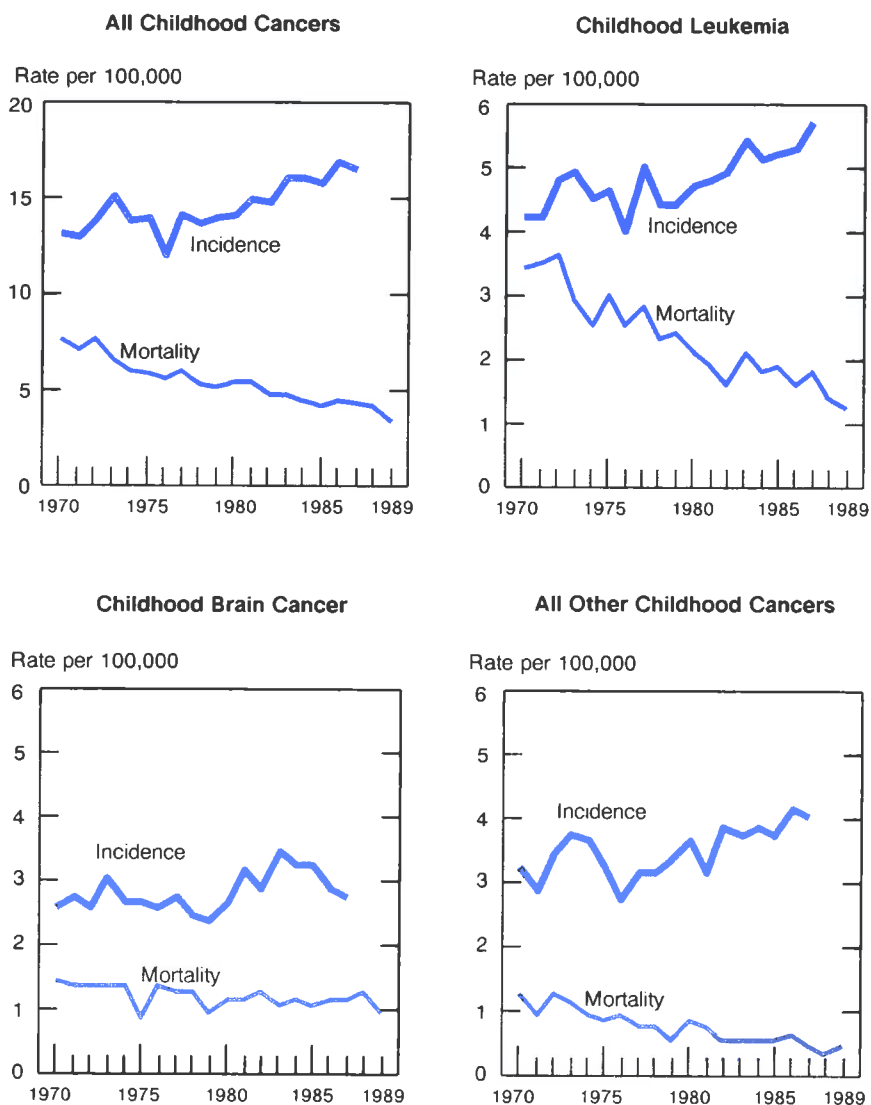
Table 15
Age-Standardized Incidence (1970-1987) and Mortality (1970-1989) Rates
for Selected Cancer Sites, Children Aged 0-14, Canada

Year	Rate per 100,000			
	All cancers	Leukemia	Brain	All other cancers
Childhood Cancer				
Incidence (1970-1987)				
1970	13.0	4.2	2.5	3.2
1971	12.9	4.2	2.7	2.8
1972	13.7	4.8	2.5	3.4
1973	15.0	4.9	3.0	3.7
1974	13.7	4.5	2.6	3.6
1975	13.9	4.6	2.6	3.2
1976	11.9	4.0	2.5	2.7
1977	14.0	5.0	2.7	3.1
1978	13.5	4.4	2.4	3.1
1979	13.8	4.4	2.3	3.3
1980	14.0	4.7	2.6	3.6
1981	14.8	4.8	3.1	3.1
1982	14.7	4.9	2.8	3.8
1983	16.0	5.4	3.4	3.7
1984	15.9	5.1	3.2	3.8
1985	15.6	5.2	3.2	3.7
1986	16.8	5.3	2.8	4.1
1987	16.3	5.7	2.7	4.0
Childhood Cancer				
Mortality (1970-1989)				
1970	7.5	3.4	1.4	1.2
1971	7.0	3.5	1.3	0.9
1972	7.6	3.6	1.3	1.2
1973	6.5	2.9	1.3	1.1
1974	5.9	2.5	1.3	0.9
1975	5.7	3.0	0.8	0.8
1976	5.5	2.5	1.3	0.9
1977	5.9	2.8	1.2	0.7
1978	5.2	2.3	1.2	0.7
1979	5.0	2.4	0.9	0.5
1980	5.3	2.1	1.1	0.8
1981	5.3	1.9	1.1	0.7
1982	4.6	1.6	1.2	0.5
1983	4.6	2.1	1.0	0.5
1984	4.4	1.8	1.1	0.5
1985	4.1	1.9	1.0	0.5
1986	4.3	1.6	1.1	0.6
1987	4.2	1.8	1.1	0.4
1988	4.0	1.4	1.2	0.3
1989	3.2	1.2	0.9	0.4

Note: Rates are adjusted to the World Standard Population and exclude non-melanoma skin cancer (ICD-9 173).

Source: Canadian Centre for Health Information, Statistics Canada.

Figure 14
Age-Standardized Incidence (1970-1987) and Mortality (1970-1989)
Rates for Selected Cancer Sites, Children Aged 0-14, Canada



Note: Rates are age adjusted to the World Standard Population and exclude non-melanoma skin cancer (ICD-9 173).

Source: Canadian Centre for Health Information, Statistics Canada.

Table 16
New Cases (1983-1987) and Deaths (1984-1988) for Histologic Cell
Types of Cancers for Children Aged 0-14, Canada

Diagnostic group ²	New cases 1983-1987 ¹		Deaths 1984-1988 ¹	
	Number	Percent	Number	Percent
1. Leukemias	1,363	30.1	457	40.2
Acute lymphocytic	1,027	22.7	230	20.2
Acute non-lymphocytic	186	4.1	83	7.3
2. Lymphomas	485	10.7	80	7.0
Hodgkin's Disease	183	4.1	4	0.4
Non-Hodgkin lymphoma	153	3.4	10	0.9
All other lymphomas	149	3.2	66	5.8
3. Brain and Spinal	789	17.4	277	24.3
Astrocytoma	360	8.0	58	5.1
Medulloblastoma	139	3.1	51	4.5
4. Sympathetic Nervous System	308	6.8	119	10.5
Neuroblastoma	297	6.6	118	10.3
5. Retinoblastoma	95	2.1	4	0.4
6. Kidney	320	7.0	29	2.6
Wilms' tumour	246	5.4	28	2.5
7. Liver	53	1.2	23	2.0
8. Bone	194	4.3	41	3.6
Osteosarcoma	91	2.0	21	1.8
Ewing's sarcoma	74	1.6	18	1.6
9. Soft Tissue Sarcomas	272	6.1	76	6.7
Rhabdomyosarcoma	161	3.6	59	5.2
10. Gonadal & Germ Cell	138	3.1	11	1.0
11. Epithelial Cancers	266	5.9	8	0.7
12. Other Cancers	239	5.3	11	1.0
Total (5 years)	4,522	100.0	1,136	100.0
Average per year	904		227	

¹ Data are shown for the most recent five year period available and exclude non-melanoma skin cancer (ICD-9 173). Data are grouped according to the International Classification Scheme for Childhood Cancer, World Health Organization.

² Only major subcategories within each group are included.

Source: Canadian Centre for Health Information, Statistics 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 the particular type of cancer that occurred during the year.
- Included are deaths of patients diagnosed in earlier years, persons newly diagnosed during the year as well as patients for whom a diagnosis of cancer is made only after death.
- Province:** For cancer incidence and mortality data, this is the province of the patient's permanent residence at time of diagnosis or death, which may or may not be identical to the province 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 been observed in the World Standard Population if the actual age-specific rates observed in the province had prevailed in the World Standard Population.

Relative Survival Rate:

The percentage of cases of a given cancer who survive a specified number of years following diagnosis, calculated by adjusting the observed survival rate for normal life expectancy in the population.

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	Testis	186
Stomach	151	Bladder	188
Colorectal	153-154	Kidney	189
Pancreas	157	Brain	191-192
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 minus Lung	140-208 minus 173, 162
Prostate	185	All Cancers	140-208 minus 173

World Standard Population: The population used to standardize rates has the following age distribution.

Age Group	Population	Age Group	Population	Age Group	Population
0-4	12,000	30-34	6,000	60-64	4,000
5-9	10,000	35-39	6,000	65-69	3,000
10-14	9,000	40-44	6,000	70-74	2,000
15-19	9,000	45-49	6,000	75-79	1,000
20-24	8,000	50-54	5,000	80-84	500
25-29	8,000	55-59	4,000	85 +	500
				TOTAL	100,000

METHODOLOGICAL APPENDIX

Data Sources and Processing

The actual cancer incidence (1970-1987) and mortality (1970-1989) data used in this monograph were obtained from two sources maintained by the Health Status Section, Statistics Canada (1,2): i) mortality data files (1970-1989), and ii) the National Cancer Incidence Reporting System (NCIRS) historical file (1969-1988). Actual 1988 incidence data were not available at the Canada level, since 1988 incidence data from Prince Edward Island (PEI) and New Brunswick were not available. Descriptions of the collection and processing mechanisms used in creating these data bases and discussion of quality issues are given in (1), (2) and (3).

Records from each province and sex were extracted and then classified, using the Ninth Revision of the International Classification of Diseases (ICD-9) (4), into selected cancer sites defined in the Glossary. Canada totals for major sites were then determined as the sum of the ten provinces. For Northwest Territories and Yukon, the 1983-1987 records were also extracted from these data bases to calculate a five year average of cancer incidence and mortality. These averages were used as 1992 estimates for the two territories.

Population figures for Canada and the provinces were taken from censal, intercensal, and post-censal estimates for 1970-1991 and from the revised series 3 population projections for 1992. The revised series 3 projections, prepared in the Fall of 1991, were chosen over the published series 3 figures (5), since they are based on more realistic fertility and immigration assumptions which closely reflect actual observations in the 1989-1991 period.

Incidence and mortality estimates for 1992 were obtained from models which were fitted to a subset of the data described above. Specifically, data from 1981 to 1987 (or up to 1988 when available), and from 1981 to 1989, were used to compute incidence and mortality estimates respectively. In previous monographs, models were fitted to all available data beginning with 1970, necessitating in some cases complex procedures which estimated extra parameters. These parameters attempted to deal with known, but not quantified, data difficulties (most notably the variability in registration in Québec for most sites prior to 1981). In this year's monograph, by using only the more recent, better quality data in model fitting, simpler models could be employed, with good results. However, the methodology was modified to address problems concerning the reporting of new cases for two provinces. Details are given below under the heading "Incidence Estimates (New Cases) for 1992".

Actual crude incidence and mortality rates for each province, sex, site and year were computed by dividing the number of cases by the corresponding provincial population figures. These rates were computed for the "under 45" and the "45 and over" age groups separately. For childhood sites, crude rates were computed for both sexes combined and the 0 to 14 years age group. Age-standardized incidence and mortality rates for each site were calculated using the World Standard Population (6; Glossary).

Mortality Estimates (Deaths) for 1992 (Tables 1, 2, 6 & Figures 1.1, 1.2)

These were estimated for each site and sex by fitting maximum likelihood models to the provincial and Canadian yearly values. The yearly counts were assumed to follow independent Poisson distributions, with mean values equal to the product of yearly population sizes and yearly death rates. Then, crude mortality rates were modelled separately for the "under 45" and the "45 and over" age groups, to obtain corresponding predicted crude rates. Those projected rates were then applied to the 1992 population projection figures to obtain the 1992 projected counts. For all sites, a linear model was used for death rates, with year as the only independent variable.

Incidence Estimates (New Cases) for 1992 (Tables 1, 2, 4, & Figures 1.1, 1.2)

These were estimated for each site and sex in a similar manner to that used for mortality. For all provinces, except PEI and Nova Scotia, a linear model for crude incidence rates, calculated separately for "under 45" and the "45 and over" age groups, was used for all sites, with year as the only independent variable. In PEI, the recent reported incidence data show a marked downward trend for most sites. For many sites in Nova Scotia, underregistration in the early eighties gives the illusion of a fairly steep upward trend in the 1981-1988 data. For both of these provinces and for each site separately, an average incidence rate was computed using three years of data: years 1983-85 for PEI and the most recently available years for Nova Scotia: 1986-88. 1992 Projected rates for the "under 45" and "45 and over" age groups were determined separately for each site by using a linear regression approach. It assumes firstly, that the y-intercept equals the average provincial rate, and secondly, that the slope equals the Canadian previously estimated slope. Since longer data series for some provinces were available, estimates for Canada were computed as the sum of the estimates for each province.

Age-Standardized Incidence Rates (ASIRs) and Mortality Rates (ASMRs) for 1992 (Tables 5, 7 & Figures 8-14)

These were estimated using weighted least squares regression (except ASIRs for PEI and Nova Scotia). The weights were taken as the inverse of the estimated variances of the actual age-standardized rates. The variances were calculated under the assumption that the age-specific counts used in the computation of the age-standardized rates followed independent Poisson distributions. Regressions were performed for Canada and each province (except PEI and Nova Scotia ASIRs) for each site and sex, using year as the independent variable. To project ASIRs for both PEI and Nova Scotia, a methodology similar to that applied for the projection of incidence counts was used. For each site separately, an average ASIR was computed using three years of data: years 1983-85 for PEI and the most recently available years for Nova Scotia: 1986-88. Projected ASIRs for 1992 were determined by starting with the average rate and assuming the rate of change for the site to be equal to the estimated slope for Canada for that site.

Accuracy and Precision

The standard error and coefficient of variation were computed to indicate the precision of each estimate. These values are available upon request from the Health Status Section of the Canadian Centre for Health Information, Statistics Canada. Readers are reminded that estimates are subject to error and that the degree of precision depends on the adequacy of the model as well as the number of observed cases and population size for each site/sex/province combination.

Due to changes and improvements in the cancer incidence data provided by the provinces, and the changes in the methodology for producing the estimates of cancer incidence and deaths, estimates in the 1992 report may not be directly comparable to those published in previous years. More detailed information on these methods can be found in technical papers available from the Health Status Section of the Canadian Centre for Health Information, Statistics Canada (7,8).

Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality (Table 14, Figure 7)

The AAPC values were calculated for each site by fitting a model which assumes a constant rate of change in the ASIRs or ASMRs, that is, a linear model for the logarithm of rates. The resulting slope of that model is then transformed back to represent a percentage increase or decrease.

Lifetime Probability of Developing Cancer (Table 11, Figure 3)

Probabilities were calculated based on the age- and sex-specific cancer incidence rates for Canada in 1987, using methodology based on Zdeb (11) and Seidman (12). As noted by Seidman the life table procedures used assume that the rates of cancer incidence for various age groups in a given chronological period will prevail throughout the future life-time of a person as he advances in age. Since these may not be the rates which will prevail at the time a given age is attained, the probabilities should be regarded only as approximations of the actual ones.

Lifetime Probability of Dying from Cancer (Table 11, Figure 3)

This probability represents the proportion of persons dying from cancer in a cohort subjected to the mortality conditions prevailing in the population at large (13). This indicator, based on 1989 data, was calculated by determining the proportion of deaths attributed to specific types of cancer for each sex and at each age, then multiplying this proportion by the corresponding number of deaths in the life table, summing the life table deaths over all sex and age groups, and finally dividing by the number of survivors at birth to obtain the probability of dying from each cause.

Potential Years of Life Lost Due to Cancer (Table 12)

This indicator, based on 1989 data, was calculated by obtaining deaths for ages 1, 1-4, 5-9, ..., 90+ and life expectancy at birth for ages 1, 5, 10, ..., 80, 85, 90. The PYLL is the equivalent to the total number of years of life lost, obtained by multiplying for each age group the number of actual deaths by the life expectancy of survivors (10).

Relative Cancer Survival (Table 13, Figures 5 & 6)

Survival data provided by the British Columbia Cancer Registry for new cases diagnosed between 1970 and 1988 were analysed to determine one, three, five, and ten year relative survival rates. Relative survival rates were calculated by adjusting the observed survival rate according to the normal life expectancy in persons from the general population in the same sex and age-group category, and time period of observation (9).

REFERENCES

- (1) Statistics Canada. Cancer in Canada (Annual). Canadian Centre for Health Information, Standard Table 41018.
- (2) Statistics Canada. Mortality - Summary List of Causes, Vital Statistics Volume III, (Annual). Canadian Centre for Health Information, Standard Table 41033.
- (3) Clarke EA, Marrett LD, Kreiger N. Twenty Years of Cancer Incidence 1964-1983 - The Ontario Cancer Registry. Ontario Cancer Treatment and Research, Toronto, 1988.
- (4) World Health Organization. International Classification of Diseases. 1975 Revision. Volumes 1 and 2, Geneva, 1977.
- (5) Perreault J (Ed). Population Projections for Canada, Provinces and Territories, 1989-2011. Statistics Canada, Catalogue 91-520 (Bilingual), 1990.
- (6) Muir C, Waterhouse J, Mack T, Powell J, and Whelan S (Eds). Cancer Incidence in Five Continents, Volume V. IARC Scientific Publication No. 88, International Agency for Research, Lyon, 1987.
- (7) Morin C. Rapport Methodologique: Estimation de l'incidence du cancer et des décès causés par le cancer pour les années 1990 et 1991 au Canada. Social Survey Methods Division, Statistics Canada.
- (8) Roberts G. Methodology Report: Estimating 1989 Cancer Incidence and Mortality in Canada. Social Survey Methods Division, Statistics Canada.
- (9) Ederer F, Axtell LM, Cutler SJ. The relative survival rate - A statistical methodology. Natl. Cancer Inst. Monogr. 1961;6:101-121.
- (10) Peron Y, Strohmenger C. Demographic and Health Indicators. Statistics Canada, Catalogue 82-543E, 1985, pp. 182-189.
- (11) Zdeb MS. The probability of developing cancer. Am J Epidemiol 1977;106:6-16.
- (12) Seidman H et al. Probabilities of eventually developing and dying of cancer. Ca-A Cancer Journal for Clinicians 1978;28:33-46.
- (13) Peron et al 1985, pp. 155-157.
- (14) Parkin DM, Stiller CA, Draper GJ, Bieber CA, Terracini B, and Young JL (Eds). International Incidence of Childhood Cancer. IARC Scientific Publication No. 87, International Agency for Research on Cancer, Lyon, 1988.

FOR FURTHER INFORMATION

Detailed Standard Tables are available upon request from Statistics Canada Reference Centres or the Canadian Centre for Health Information, Statistics Canada. Information on cancer incidence and mortality can be obtained annually from Health Reports: Cancer in Canada, Catalogue 82-003S8. Also, hospital statistics on cancer can be obtained from "Hospital Morbidity" Standard Table 41017. Analytical articles appear regularly in Health Reports, Statistics Canada, Catalogue 82-003, Quarterly.

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Cancer incidence data are supplied to Statistics Canada by provincial/territorial cancer registries who may be contacted for up to date detailed data for their areas. (See next page)

Information on on-going risk assessment in the epidemiology of cancer is available from Director, Bureau of Chronic Disease Epidemiology, Laboratory Centre for Disease Control, Health and Welfare Canada, Tunney's Pasture, Ottawa, Ontario, K1A 0L2.
Tel. (613) 957-0327; FAX (613) 941-2057.

PROVINCIAL/TERRITORIAL CANCER REGISTRIES

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Director of Data Services and
Cancer Registries,
Newfoundland Cancer Treatment
and Research Foundation,
25 Kenmount Road,
St. John's, Newfoundland
A1B 1W1
Tel. (709) 753-2599
Fax. (709) 753-0927

Prince Edward Island

Provincial Oncologist,
Division of Oncology Services,
Department of Health,
P.O. Box 2000,
Charlottetown, Prince Edward Island
C1A 7N8
Tel. (902) 566-6027
Fax. (902) 566-6384

Nova Scotia

Director,
Nova Scotia Cancer Registry,
Cancer Treatment and Research
Foundation of Nova Scotia,
5820 University Avenue,
Halifax, Nova Scotia B3H 1V7
Tel. (902) 428-4255
Fax. (902) 428-4277

New Brunswick

Director, Health Promotion
and Disease Prevention
Department of Health & Community
Services,
P.O. Box 5001,
Fredericton, New Brunswick
E3B 5G8
Tel. (506) 453-3092
Fax. (506) 453-2726

Quebec

Chef du service des études
opérationnelles,
Ministère de la santé et des
services sociaux,
1075, chemin Ste-Foy, 3ième étage,
Québec, (Québec)
G1S 2M1
Tel. (418) 643-9936
Fax. (418) 646-1956

Ontario

Director, Ontario Cancer
Registry,
Epidemiology and Statistics,
The Ontario Cancer Treatment
and Research Foundation,
7 Overlea Boulevard,
Toronto, Ontario
M4H 1A8
Tel. (416) 423-4240
Fax. (416) 423-2017

Manitoba

Director, Oncology Records and
Registry,
Manitoba Cancer Treatment
and Research Foundation,
100 Olivia Street,
Winnipeg, Manitoba
R3E 0V9
Tel. (204) 787-2162
Fax. (204) 783-6875

Saskatchewan

Director of Data Services,
Saskatchewan Cancer Foundation,
2631-28th Avenue,
Regina, Saskatchewan
S4S 6X3
Tel. (306) 585-1831
Fax. (306) 584-2733

Alberta

Director, Department of Epidemiology
and Preventive Oncology,
Alberta Cancer Board,
9707-110th St., 6th floor,
Edmonton, Alberta
T5K 2L9
Tel. (403) 482-9370
Fax. (403) 488-7809

British Columbia

Director of Information Systems,
British Columbia Cancer Agency,
600 West Tenth Avenue,
Vancouver, British Columbia
V5Z 4E6
Tel. (604) 877-6000
Fax. (604) 872-4596

Northwest Territories

Health Researcher, Medical
Directorate,
Department of Health,
Government of the Northwest
Territories,
P.O. Box 1320,
Yellowknife, N.W.T.
X1A 2L9
Tel. (403) 873-7033
Fax. (403) 873-5072

Yukon

Assistant Deputy Minister,
Health Services,
Health and Human Resources,
P.O. Box 2703,
Whitehorse, Yukon
Y1A 2C6
Tel. (403) 667-5811

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Newfoundland & Labrador Division,

Canadian Cancer Society,
Chimo Building, 1st floor,
P.O. Box 8921,
Freshwater & Crosbie Road,
St. John's, Newfoundland
A1B 3R9
Tel. (709) 753-6320
Fax. (709) 753-9314

Prince Edward Island Division,

Canadian Cancer Society,
P.O. Box 115,
131 Water St., 2nd floor,
Charlottetown, Prince Edward Island
C1A 1A8
Tel. (902) 566-4007

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,
63 Union Street,
P.O. Box 2089,
Saint John, New Brunswick
E2L 3T5
Tel. (506) 634-6272
Fax. (506) 634-3808

Quebec Division,

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

National Office,

Canadian Cancer Society,
10 Alcorn Avenue, Suite 200,
Toronto, Ontario
M4V 3B1
Tel. (416) 961-7223
Fax. (416) 961-4189

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) 786-6286

Saskatchewan Division,

Canadian Cancer Society,
201-2445 13th Avenue,
Regina, Saskatchewan
S4P 0W1
Tel. (306) 757-4260
Fax. (306) 569-2133

Alberta & N.W.T. Division,

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

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