Cancer Trends

in

Prince Edward Island

1983 - 1997

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Front cover photo by Kenneth Ginn provided by the PEI Department of Tourism.

This book is dedicated to all Islanders who have been touched by cancer.

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Introduction

Prince Edward Island is Canada's smallest province: it is 280 kilometres from one end to the other. One of the maritime provinces, it is located in the Gulf of St. Lawrence on the Atlantic coast. About 60% of the population is rural, and 40% live in urban areas of Charlottetown and Summerside. PEI has a relatively stable and homogenous population with low migration rates (less than 2%) and over 95% of Western European origin. The major primary industries are agriculture, tourism, and fishing.

The data presented in this report describe trends in cancer incidence and mortality in Prince Edward Island over the period 1983 to 1997. Trends are compared over time, and PEI trends are compared to Canadian trends. PEI trends show large fluctuations from year to year, since PEI has a small population and small numbers of cases that can easily "triple" from 3 cases in one year to 9 cases the next year.

Presentation of Data

Data are presented in four graphs for most sites to show temporal trends, separating male and female rates, and incidence and mortality rates. All rates are age standardized to the 1991 Canadian population. All PEI trend lines are three-year moving averages to smooth out annual fluctuations. All estimates are shown as lightly shaded lines.

Highlights

Cancer is not a single disease; it is a process of uncontrolled cell growth. Of the heterogeneous group of cancer diseases, three sites account for over half of all cancers in men: prostate, lung, and colorectal. In women, three sites also account for over half of all cancers: breast, colorectal, and lung.

Cancer is primarily a disease of older people. Two out of every five men and one out of every three women are expected to develop cancer during their lifetime.

About **half** of all fatal cancers are caused by tobacco smoking and diets high in fat and low in fibre, fruits, and vegetables. Smoking-related cancers dominate cancer mortality. If smoking-related cancers were eliminated, cancer deaths would remain stable for men, and decrease for women.

PEI cancer rates fluctuate around the Canadian trend lines. Over the period 1983 to 1995, the trends have generally been increasing.

Increasing trends :

- The most dramatic increases are for prostate cancer in men, and breast, colorectal, and lung cancer in women. Each of these sites have increases in incidence, whereas the mortality rates are relatively stable.
- Cancer rates have been gradually increasing in Canada and PEI for skin melanoma, non-Hodgkin's lymphomas, and kidney cancer.

Stable trends :

- Cancer rates have been stable in PEI for brain tumours and childhood cancers.
- In PEI, pancreatic cancer rates have been stable, while Canadian rates have been declining for men.
- Cervical cancer rates have also been stable in PEI, in spite of the availability of Pap screening, and declining Canadian rates.

Decreasing trends :

- Cancer rates have been declining slightly in PEI and Canada for bladder, stomach, ovarian, and uterine cancers.
- In men, colorectal and lung cancer are also declining.
- The incidence of leukemia is decreasing in PEI, whereas the Canadian rates have been stable.

Data Sources

1. PEI Cancer Registry

In PEI, the Cancer Registry is situated in the Oncology Department of the Queen Elizabeth Hospital in Charlottetown. Incident cases of cancer were first recorded in the 1950s. In 1969, data was first submitted to Statistics Canada. The PEI Cancer Registry now has electronic records dating back to 1969.

Cancer is a reportable disease named in the Public Health Act. The major sources of data are pathology reports which include autopsy and cytology reports, death certificates that mention cancer, and oncology clinic reports. Since 1983, the Cancer Registry has used the unique lifetime provincial health identification number to identify multiple reports for the same person.

Only new primary sites of cancer are registered. This means that malignant cancers that have spread (metastasized) to other organs such as lung or liver are not coded to the organ of metastasis. If a person has two different types of cancer, each type of cancer is registered. Canadian cancer registries allow multiple primaries within one major site, such as breast, skin, or colon.

The primary site of cancer is coded according to the International Classification of Diseases (World Health Organization). From 1983 to 1991, the PEI Cancer Registry used the ICD-O-1 codes. Since 1992, cancer sites have been coded using ICD-O-2, and previous years data were converted to the most recent codes. Appendix 1 describes the sites used in this report.

Counts published in the appendices of this report may not agree with previously published data, since information in the PEI Cancer Registry is updated regularly.

New cancer cases are counted by the year of diagnosis. The most recent complete year available for new cancer cases in PEI is 1995.

2. Canadian Cancer Cases

Provincial cancer registries provide figures on new cancer cases to the Canadian Cancer Registry. Counts of new primary sites of cancer, by ICD-9 site code, sex, and age group are contained in “Cancer in Canada” produced annually by Statistics Canada. New cancer cases are counted by year of diagnosis. The most recent year available for new cancer cases in Canada is 1992.

3. Population Data

Statistics Canada conducts a census every five years, and estimates provincial and national population counts for the intercensal years. This report used mid-year population estimates published in “Annual Demographic Statistics” by Statistics Canada. These estimates were available for each year covered in this report.

4. Mortality Data

The source of cancer mortality data is death certificates. If the underlying cause of death described by the certifying physician is cancer, the death is counted as a cancer death. The description of the type of cancer is less precise than that obtained by the cancer registry. Also, cancer deaths occurring in a given year will usually be the result of cancers diagnosed in previous years.

Counts of cancer deaths, by ICD-9 site code, sex, and age group are contained in “Causes of Death” produced annually by Statistics Canada.

Cancer deaths are counted by year of death. The most recent year available for cancer death counts in Canada is 1995.

5. Estimates

Where recent mortality and incidence were not available, estimates were used from “Canadian Cancer Statistics” produced by the National Cancer Institute of Canada. These estimates were used to calculate age-standardized estimates using the 1991 Canadian population as the standard. Incidence estimates are based on data that is 5 years old, which may cause underestimates of cancer sites that are increasing or overestimate for sites that are decreasing. All estimates are shown on the graphs in this report as lightly shaded lines.

Data Quality

Mortality data has only one source: death certificates maintained by Vital Statistics. All deaths are registered, although the description of the type of cancer is less precise than that obtained by the cancer registry.

All new cases of cancer are registered by the PEI Cancer Registry. Patients with cancer that are not diagnosed by the medical care system or at death are not registered; this is rare in PEI. Registry staff ensure that cases are not duplicates of previously registered persons. No records for the period 1983 to 1995 are missing residence information, date of birth, age at diagnosis, name, or unique health number.

Table 1 shows several measures of data quality used by cancer registries: the percent of new cases registered on the basis of a death certificate only, the percent of cases microscopically confirmed, the mortality/incidence ratio, and the percent of cases coded as an unknown or ill-defined site.

A case with a death certificate as the only source of information is considered of lesser quality, since microscopic confirmation is not available and some reports are incorrect. Initially in PEI, death certificates were recorded as the *first* source identified. Starting in 1983, a death certificate was recorded as the most reliable source of information if it was the *only* source. In 1985, limited follow-up of death certificates began. Since 1989, the PEI Cancer Registry has actively followed all cancer deaths for confirmation. Table 1 shows the improvement in data quality this change in follow-up made on PEI.

Microscopic confirmation means the diagnosis has been confirmed by histology, autopsy, or cytology. The mortality/incidence ratio is the number of cancer deaths in a year divided by the number of incident cases, expressed as a percent. Ratios of over 60% indicate possible under-reporting of incidence. Fewer than 5 percent of cancers were unknown primaries (ICD9 195-199). Table 1 shows the steady improvement in all the quality indices over time.

Table 2 shows the relationship between quality indicators and cancer site. Sites with the highest fatality rate are the least likely to be microscopically confirmed. These sites also have the highest mortality/incidence ratios, which are a crude estimate of survival. Sites with the best prognosis have the lowest mortality/incidence ratios.

Table 1. Quality indicators for all cancers in PEI, by year

Year	% death certificate only	% microscopically confirmed	Mortality/incidence ratio (%)	% unknown or ill-defined site
1983	9.5	88.3	54.2	5.1
1984	11.3	86.6	53.7	3.8
1985	9.5	88.8	58.6	4.3
1986	7.0	87.2	66.9	5.6
1987	4.3	90.6	53.1	4.7
1988	5.1	91.1	47.0	4.6
1989	2.9	91.7	46.7	3.6
1990	2.7	91.8	52.2	3.2
1991	2.5	90.4	54.8	3.2
1992	1.0	91.2	48.8	3.3
1993	0.7	91.1	46.1	3.5
1994	0	92.7		3.1
1995	0	93.5		1.3
PEI ave	4.4	90.3	52.9	3.7
CCR[†] ave	2	85	51	3.3

[†] Canadian Cancer Registry, 1984 to 1988

Table 2. Quality indicators 1983 to 1993, by cancer site

Site	% microscopically confirmed		Mortality/incidence ratio (%)	
	PEI	CCR[†]	PEI	CCR[†]
Pancreas	46	55	100	98
Lung	80	78	85	81
Stomach	79	86	77	72
Brain	71	74	79	73
Leukemia	81	65	58	62
Ovary	89	90	55	61
NH Lymphoma	96	89	42	44
Colorectal	93	90	32	42
Kidney	86	80	48	41
Cervix	98	92	39	29
Prostate	93	92	33	31
Breast	96	93	33	35
Bladder	96	92	26	25
Uterus	96	97	19	20
Skin Melanoma	99	94	18	20

[†] Canadian Cancer Registry, 1984 to 1988

Definitions

CANCER
Cancer is not a single disease; it is a process of uncontrolled cell growth. Cancer is usually classified by the organ or site of origin.

The most frequent form of cancer is basal cell or squamous cell skin cancer. Since these tumours are usually treated simply and successfully without requiring hospitalization, they are difficult to register completely. Inconsistencies in reporting resulted in the Canadian Cancer Registry excluding these cancers in 1992. These common non-melanoma skin cancers are excluded from this report.

AGE
The age of the patient at the time of diagnosis in years.

DATE OF DIAGNOSIS
Diagnosis can be confirmed at the time of a pathology report, X-ray report, surgical report, clinical determination, or on the death certificate. The date of diagnosis is the date of the *first* confirmatory report.

CANCER INCIDENCE
The number of new cases of invasive cancer diagnosed per year. Metastatic and carcinoma-in-situ cancers are excluded. Benign tumours are only included for the central nervous system.

CANCER MORTALITY
The number of deaths due to cancer, based on the cause of death as reported on the death certificate.

AGE-STANDARDIZED INCIDENCE RATE
The rate of new cancer cases in the population, weighted by the age structure of a standard population. The calculation uses 18 age groups (0-4, 5-9, ..., 80-84, 85+), and the standard population is the 1991 Canadian population. The rate is expressed as the number of new cancer cases per 100,000 population per year.

AGE-STANDARDIZED MORTALITY RATE
The rate of cancer deaths in the population, weighted by the age structure of a standard population. The calculation uses 18 age groups (0-4, 5-9, ..., 80-84, 85+), and the standard population is the 1991 Canadian population. The rate is expressed as the number of cancer deaths per 100,000 population per year.

THREE-YEAR MOVING AVERAGE
Incidence and mortality rates are averaged over 3 year periods to smooth out annual fluctuations. This was calculated for all PEI rates shown on the graphs, since small numbers of cases can cause large fluctuations in rates. This was not

used for Canadian rates shown on the graphs, since the large number of cases produce more stable rates.

AGE-SPECIFIC INCIDENCE RATE

The rate of new cases in one age group of the population. The age groups used are: 0-24 years, 25-54 years, 55-74 years, and 75+ years at time of diagnosis. These rates cover the period 1983 to 1995, and are not weighted by a standard population.

FIVE-YEAR RELATIVE SURVIVAL RATE

The survival of cancer patients over the first 5 years after diagnosis, adjusted for causes of death other than cancer. Survival rates measure prognosis, and are influenced by the ability to cure the disease, as well as the stage of the cancer at the time of diagnosis. Five year survival rates are interpreted as:

1. excellent prognosis (5 year survival 85% or greater)
2. good prognosis (5 year survival 70% - 84%)
3. fair prognosis (5 year survival 30% - 69%)
4. poor prognosis (5 year survival less than 30%)

Canadian survival rates are used in this report.

Cancer Trends - All Sites

Cancer is a heterogeneous group of many malignant diseases. From 1983 to 1995, three sites account for over half of all cancers in both sexes, as seen in Table 3.

Table 3. Most common cancer sites in PEI, 1983 to 1995

New Cancer Cases

Men		Women	
Site	% of incident cancers	Site	% of incident cancers
Prostate	23%	Breast	28%
Lung	20%	Colorectal	15%
Colorectal	13%	Lung	11%
Bladder	5%	Uterus	5%
Kidney	3%	Ovary	4%

Cancer Deaths

Men		Women	
Site	% of cancer deaths	Site	% of cancer deaths
Lung	32%	Lung	20%
Prostate	14%	Breast	19%
Colorectal	8%	Colorectal	11%
Pancreas	6%	Pancreas	6%
Stomach	4%	Stomach	4%

Cancer is predominately a disease of late adulthood. The incidence of cancer is nearly 30% higher in men than in women.

The study of temporal trends for all sites combined is more useful for describing changes or differences in the relative burden of cancer, than for relating these changes to specific etiologic agents.

Risk factors

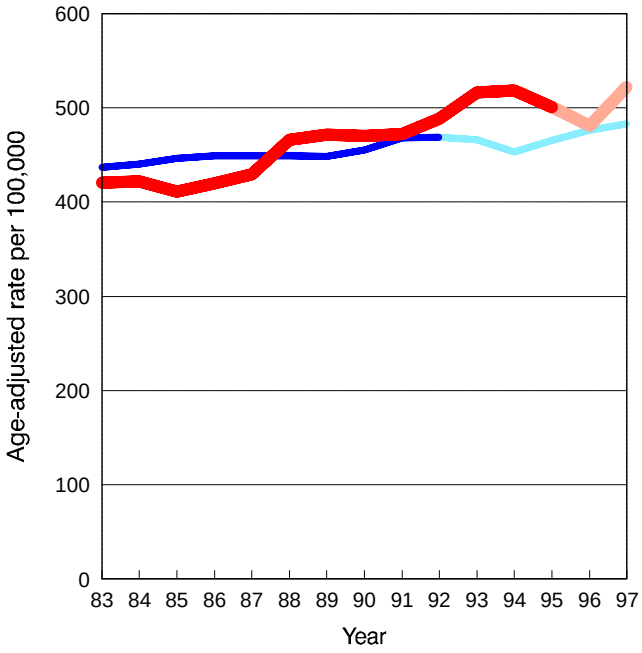
Estimates of the proportion of cancer deaths attributable to known risk factors in Canada suggest that approximately **half** of all fatal cancers are attributable to tobacco (29%) and diet (20%). Occupation (9%), family history (8%) and alcohol (6%) are the next most common causes. Finally, reproductive factors (4%), sexual activity (3%), sunlight (1%), drugs (1%) and ionizing radiation (1%) account for some of the remainder. About 18% of fatal cancers are attributable to unknown risk factors.

Prevention and Early Detection

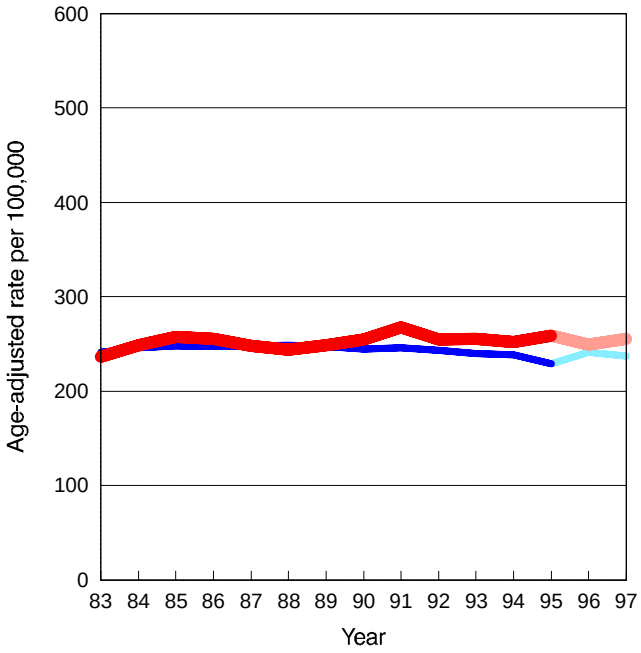
About half of cancer deaths in Prince Edward Island may be preventable by eliminating tobacco smoking and changing our diet to include more fruits, vegetables, and fibre, and less fat. Early detection of cervical cancer and breast cancer through screening programs can reduce incidence and/or mortality. However, maximum impact from such programs may not be felt unless strong organizational structures are in place to ensure high population coverage, compliance, and quality control. Mass screening for other cancers is not recommended at the present time.

Cancer Trends - All Sites

Trends in **Incidence** - Male



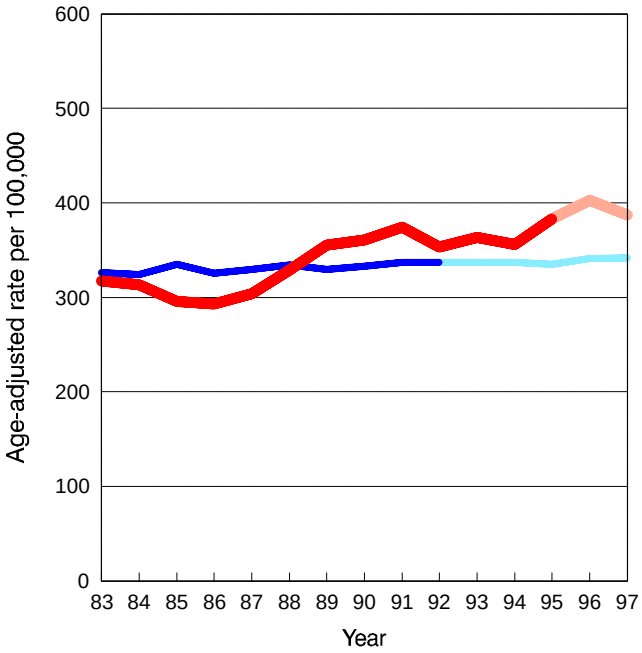
Trends in **Mortality** - Male



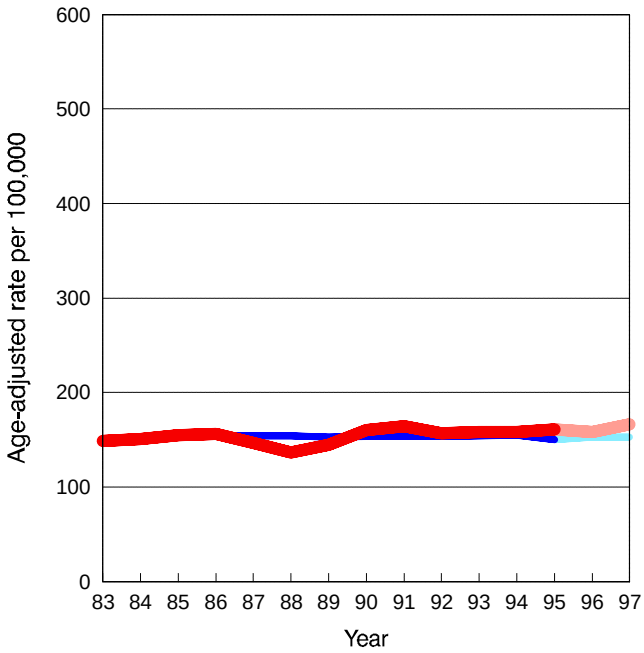
PEI Canada

lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** -Female



Smoking-Related Cancers

Smoking is the most common cause of cancer. One third of all fatal cancers could be prevented if smoking was eliminated.

Smoking-related cancers include:

- lung (90% caused by smoking)
- upper airway (85% caused by smoking)
- esophagus (80% caused by smoking)
- bladder (50% caused by smoking)
- kidney (50% caused by smoking)
- pancreas (30% caused by smoking)
- cervix (less than 20% caused by smoking)

In PEI, over the period 1983 to 1995, deaths caused by smoking-related cancers doubled for women primarily due to lung cancer. For men, over the same period, deaths caused by smoking-related cancers increased by 11%.

The dominant effect of smoking-related cancers is shown in the graph of mortality trends. Over the period 1983 to 1995, overall cancer mortality rates among both men and women increased slightly. However, when smoking-related cancers are excluded the male cancer mortality rate has remained relatively stable. Among women, when smoking-related cancers are excluded, the cancer mortality rate declines by an impressive 16% over the same period.

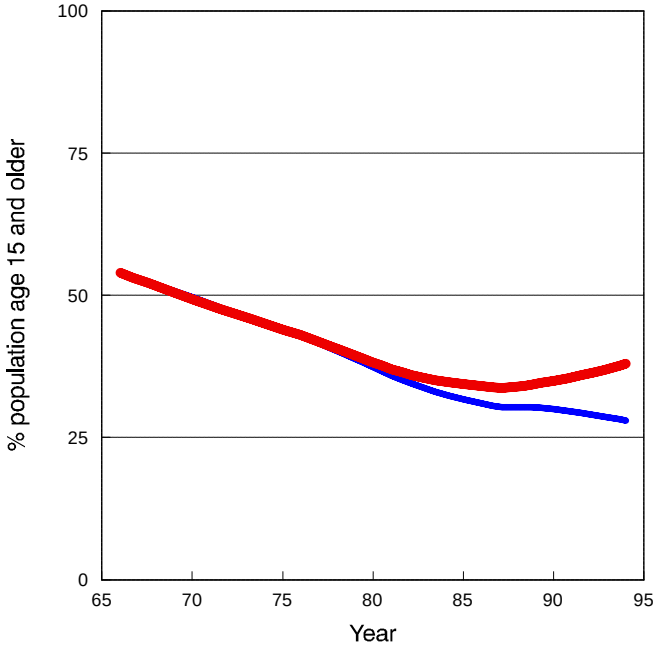
The latent interval between smoking and development of cancer is about 20 years.

Surveys of smoking began in 1966. Canadian daily smoking rates show dramatic declines in male smoking by the mid 1980s, with slower declines more recently. The Canadian female smoking trend has shown a gradual decline, but this decline is not consistent for all women, with increases in the number of young women smoking.

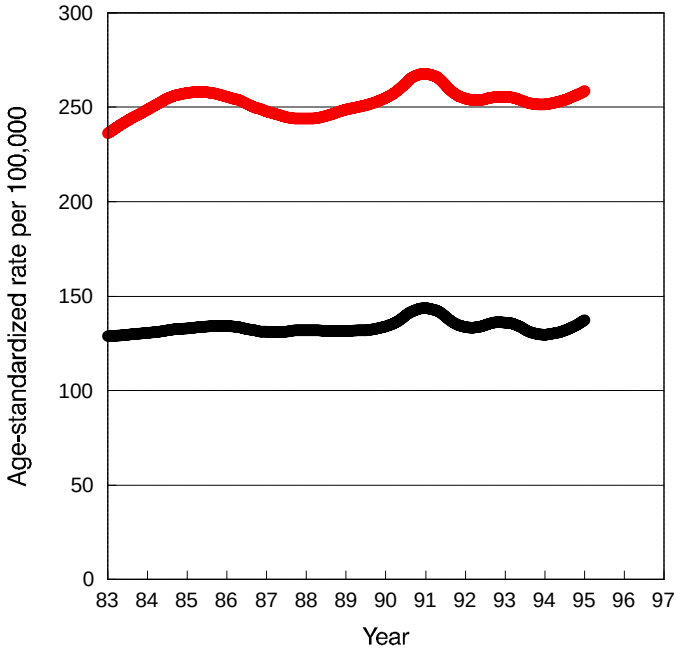
PEI daily smoking rates for men show a similar dramatic decline until the mid 1980s, and have more recently increased. PEI smoking rates for women increased up to the mid 1970s and have declined only slightly since then. The more recent decline for women overall hides the fact that more female youth in PEI are smoking than male youth.

Smoking-related Cancer

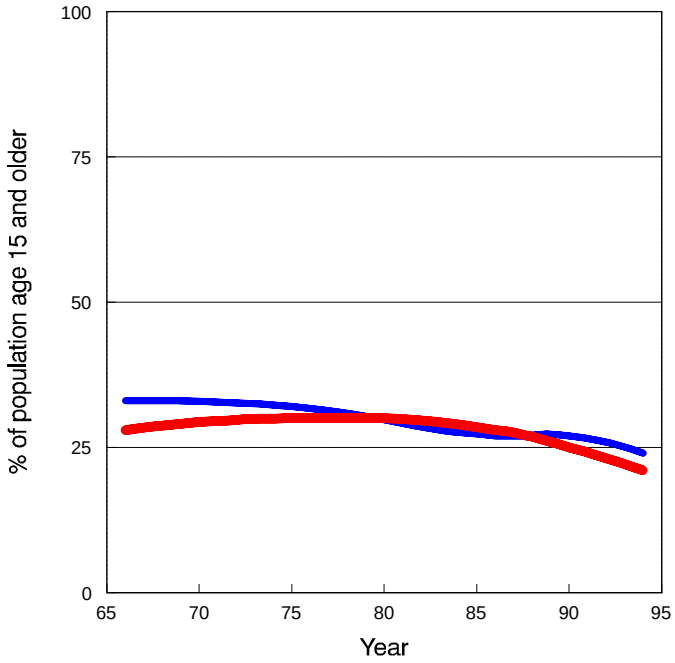
Daily **Smoking** Rates - Male



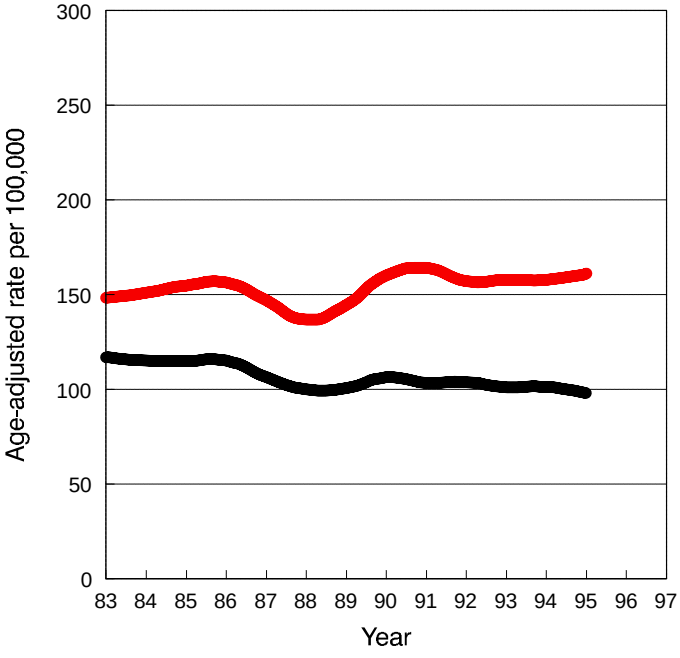
Trends in **Mortality** - PEI Males



Daily **Smoking** Rates - Female



Trends in **Mortality** -PEI Females



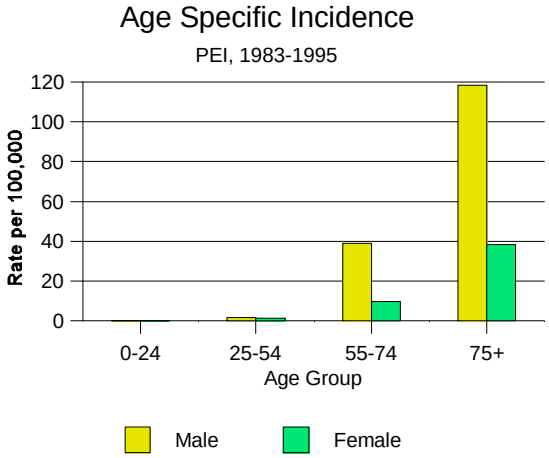
Bladder

Mortality and incidence of bladder cancer are declining slightly over time. The five year relative survival for this tumour is between 75% and 80%, indicating a good prognosis.

Age and Gender Influence

Bladder cancer is predominately a disease of late adulthood.

Incidence of bladder cancer is nearly four times more common in males than in females.



Risk factors

The risk of bladder cancer is higher for persons who:

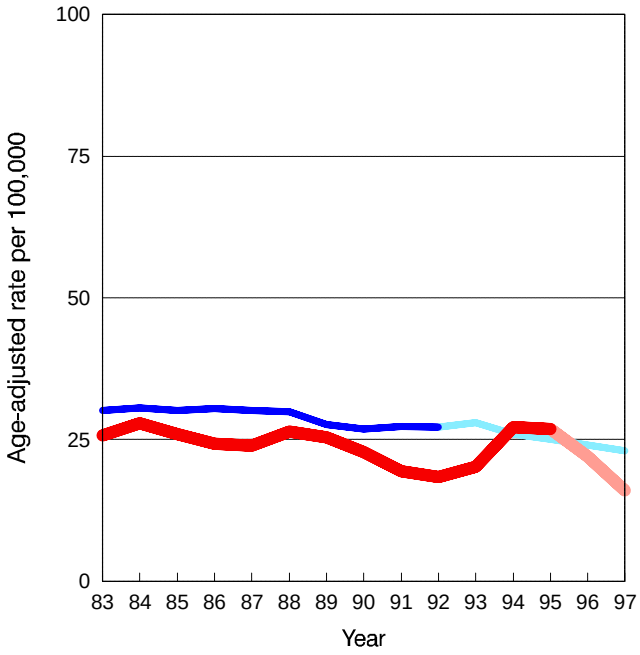
- smoke
- have chronic occupational exposure to rubber, leather, paint, or aluminum

Prevention and Early Detection

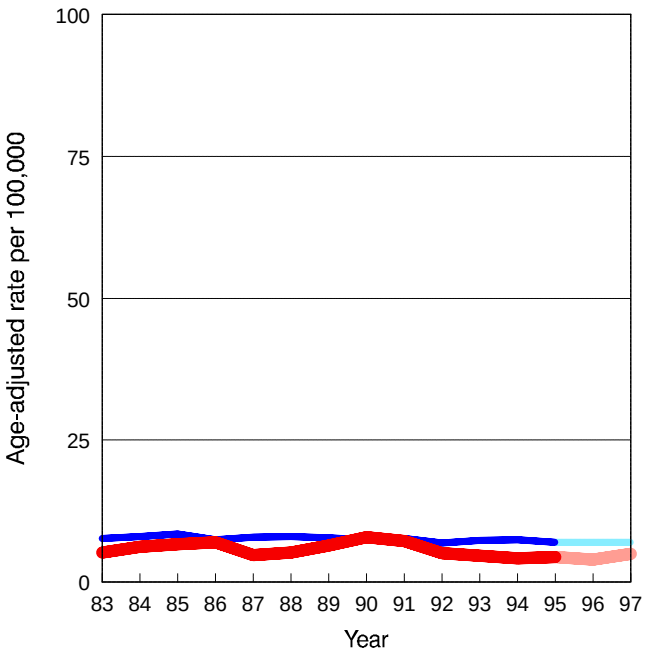
The most effective way to reduce bladder cancer is to reduce smoking. Early detection uses a urine sample to detect abnormal bladder cells. This screening test is used for occupational groups with exposure to bladder carcinogens. The test has not demonstrated a benefit for reducing the mortality of bladder cancer.

Bladder

Trends in **Incidence** - Male



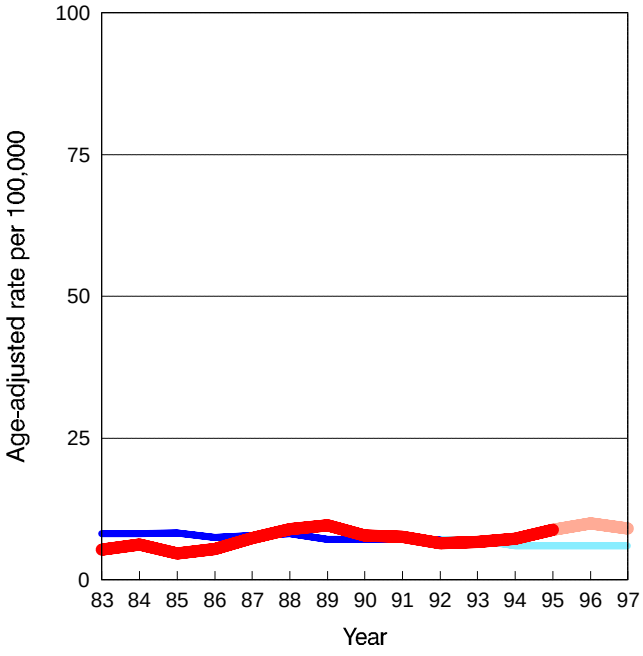
Trends in **Mortality** - Male



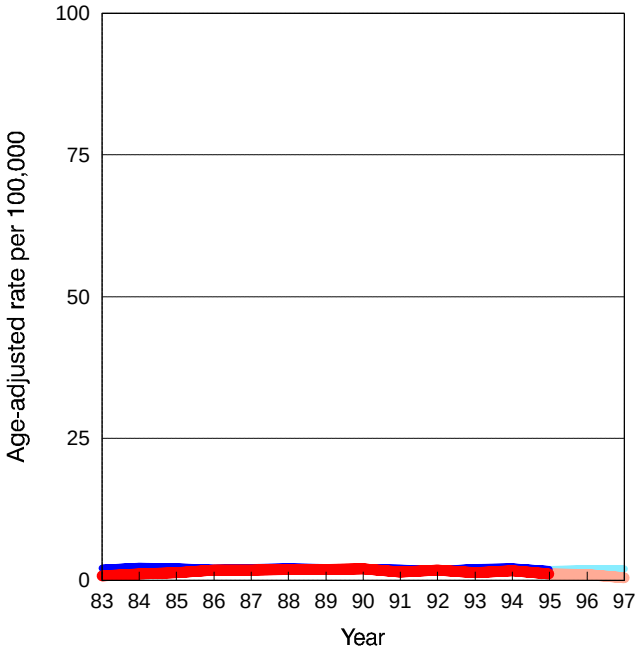
PEI Canada

lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female

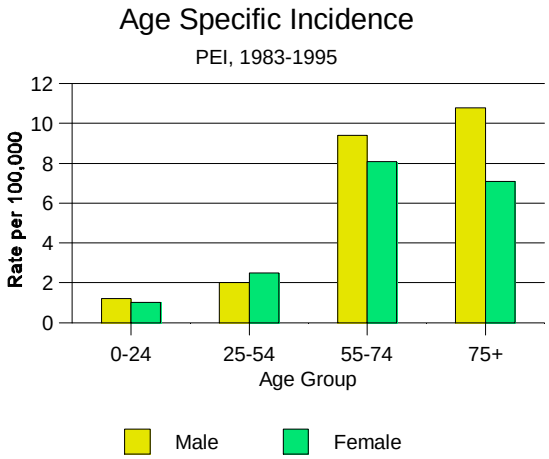


Brain

Benign and malignant tumours of the central nervous system (CNS) occur in the brain, meninges, and spinal cord. Mortality and incidence have been quite stable over time. The five year relative survival is between 25% to 30%, indicating a poor prognosis. Survival is better for children.

Age and Gender Influence

Brain tumours are the second most common neoplasm in children. Brain tumours are slightly more common in males than females.



Risk factors

Little is known about the causes of brain cancer. Tobacco, alcohol, diet, and head injury do not appear to cause brain cancer.

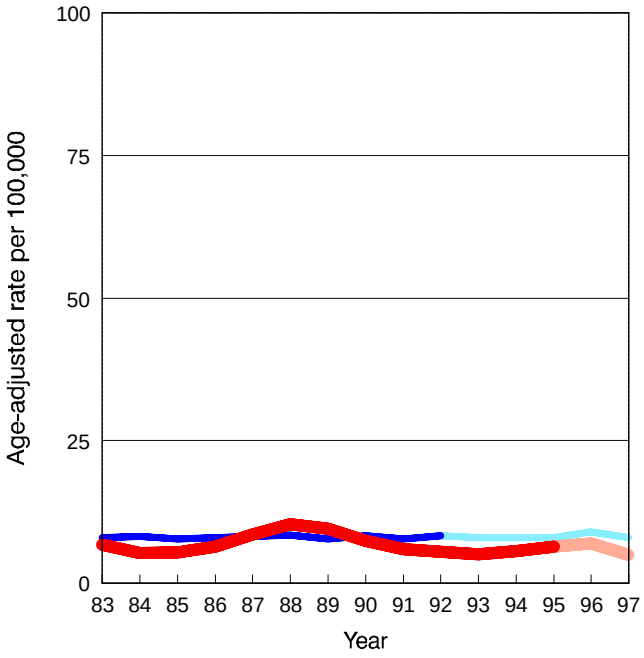
Exposure to ionizing radiation, vinyl chloride, and formaldehyde are associated with malignant tumours. A family history of brain tumours or certain genetic disorders may predispose people to brain tumours.

Prevention and Early Detection

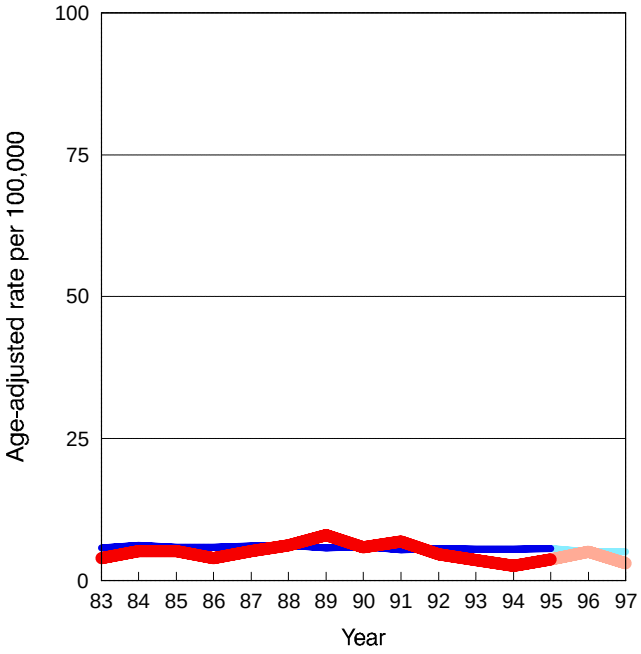
There is not enough known about the causes of brain tumours to prevent them. There are no screening tests available.

Brain

Trends in **Incidence** - Male

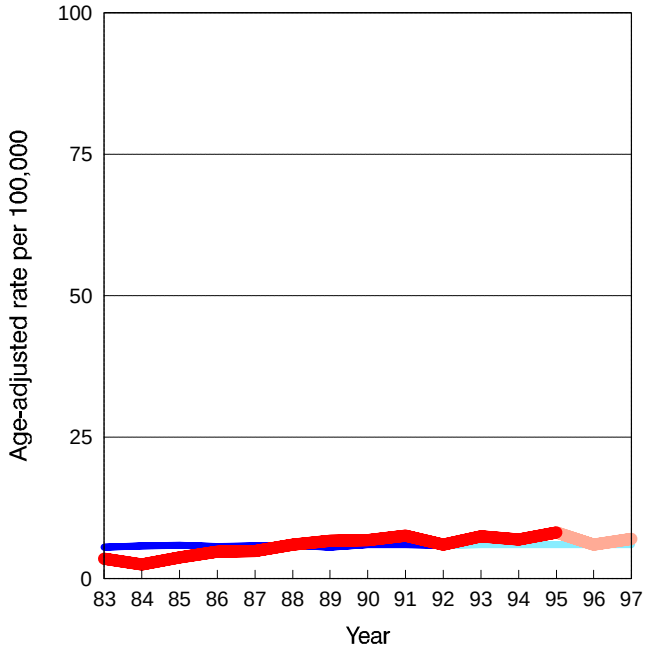


Trends in **Mortality** - Male

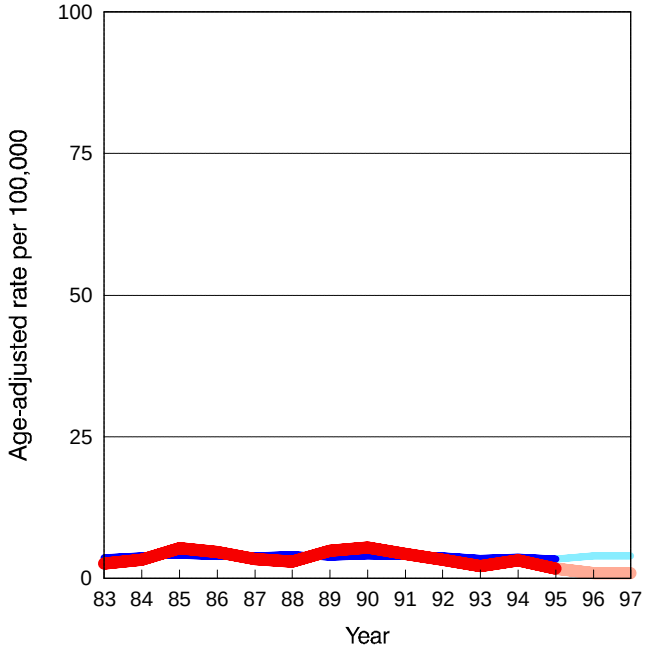


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female



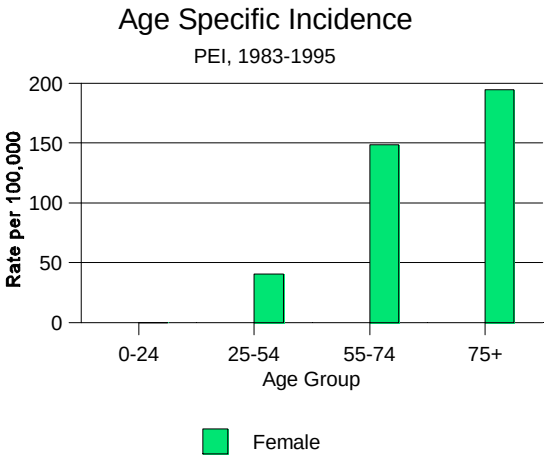
Breast

Breast cancer is currently the most commonly diagnosed cancer in Prince Edward Island women and in women in most industrialized countries. Although the incidence of breast cancer is rising, mortality has been relatively stable and is starting to drop. The five year relative survival is 73%, indicating a good prognosis.

Age and Gender Influence

Breast cancer does occur in males, but it is rare.

The chance of developing breast cancer increases with age. In PEI and elsewhere, incidence has been increasing in women 55 and over.



Risk factors

The risk of breast cancer is higher for women who have:

- a family history of breast cancer, especially in a mother or sister at a young age
- never been pregnant
- a previous diagnosis of ovarian cancer, endometrial cancer, or cancer in the other breast

The effect of oral contraceptives, hormone replacement therapy, and high dietary fat remains unclear and/or controversial.

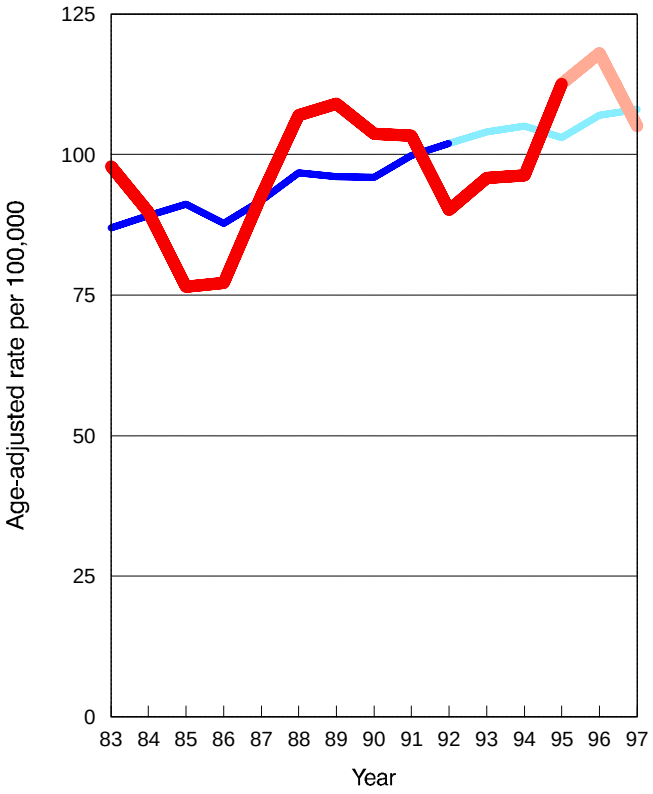
Prevention and Early Detection

Most of the factors that increase the risk of developing breast cancer have only a small influence and are not easy to modify.

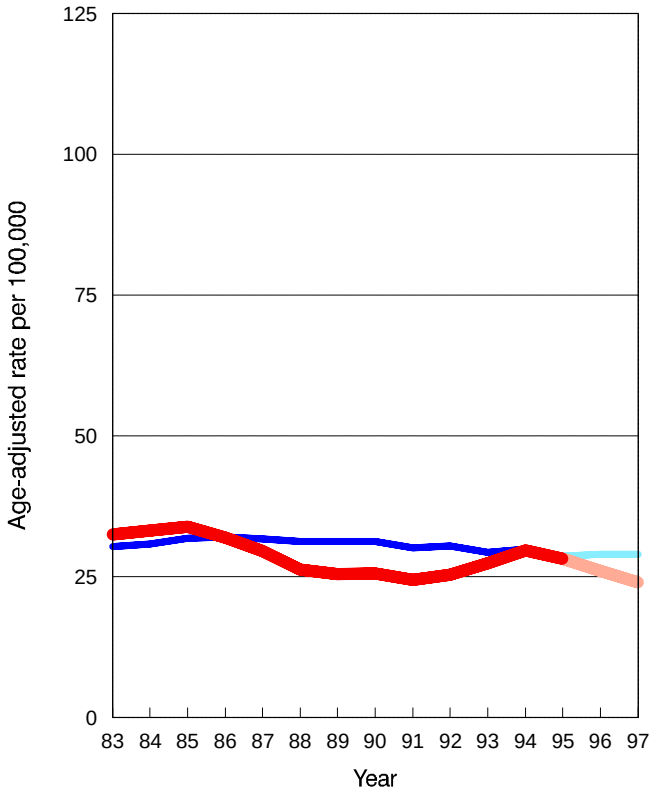
The early detection of breast cancer by mammography in women over the age of 50 has been shown by many studies to reduce mortality by about 30%. Mammography screening became available in PEI in 1987 on a full-day, every-day basis. Screening provides an earlier diagnosis and increases the likelihood of a cure. This increases the incidence of breast cancer, without increasing the breast cancer mortality rate. Prince Edward Island is introducing a formal mammography screening program.

Breast

Trends in **Incidence** - Female



Trends in **Mortality** - Female



PEI Canada

lightly shaded lines are estimates

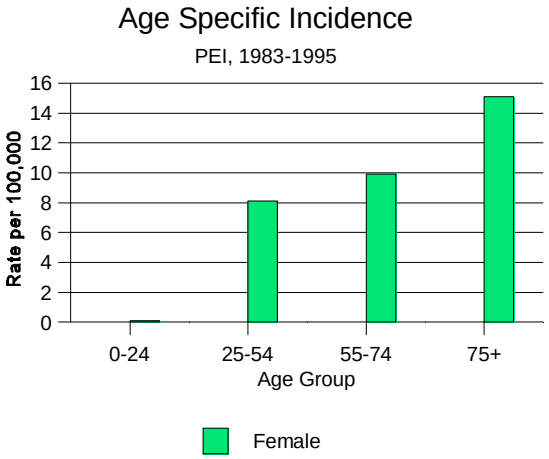
Cervix

Invasive cancer of the cervix is the easiest cancer to prevent. The incidence and mortality of cervical cancer is declining in Canada, although this trend is not apparent in PEI. The five year relative survival is 70%, indicating that cervical cancer can be diagnosed and treated successfully at an early stage.

Age Influence

Cervical cancer generally develops before the age of 70, with the average age of diagnosis at 45 years.

In PEI, some women have been diagnosed after age 70 since they were not screened earlier.



Risk factors

The risk of cervical cancer is higher for women who:

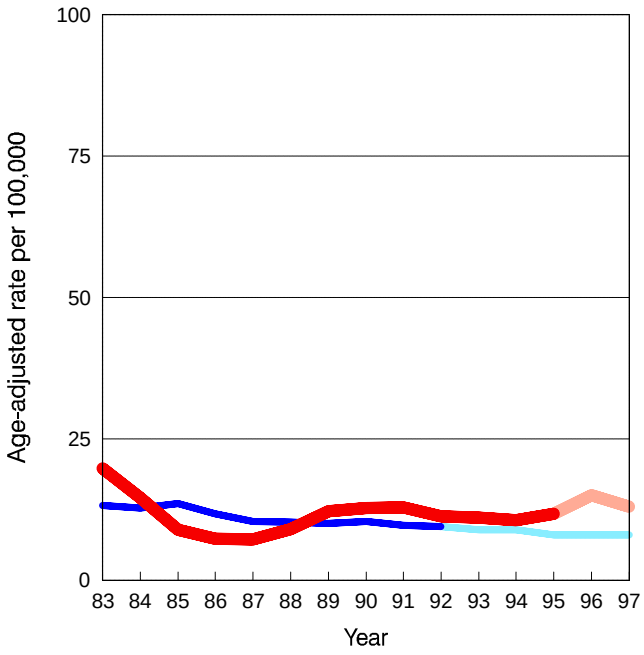
- are sexually active
- have a Pap test with abnormal cells
- smoke

Prevention and Early Detection

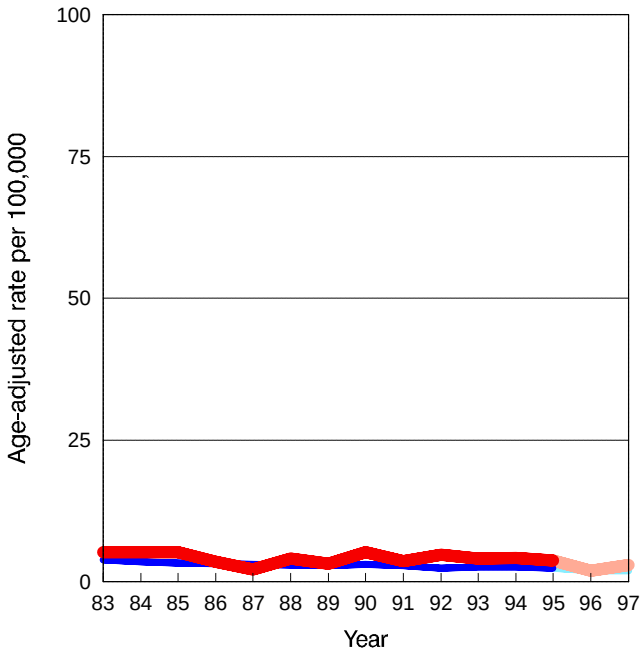
Cervical cancer is the only cancer where early detection is the same as prevention. Early detection uses a Pap smear to detect abnormal cervical cells before they become cancerous or invasive. Canadian guidelines recommend that, in the context of an organized screening program, women aged 18 to 69 should be screened every three years, after two normal annual tests. Prince Edward Island is in the process of implementing such a program.

Cervix

Trends in **Incidence** - Female



Trends in **Mortality** - Female



PEI Canada

lightly shaded lines are estimates

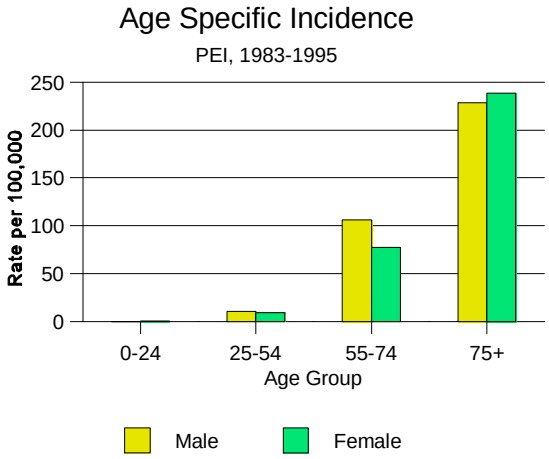
Colon and Rectum

The majority of colorectal cancers occur in the region of the sigmoid colon and rectum. In Canada, incidence has been decreasing, especially among women. However, the incidence has been increasing among PEI women. Mortality has been decreasing for both men and women. The five year relative survival is about 50%, indicating a fair prognosis.

Age and Gender Influence

In Canada, the incidence of colorectal cancer is about 40% higher in men than in women. In PEI, the male and female rates are similar.

The incidence of colorectal cancer increases with age. In PEI, over the period 1983-1995, incidence has been decreasing in women 75 years and over, but increasing in women 55 to 74 years.



Risk Factors

The risk of colorectal cancer is higher for persons who:

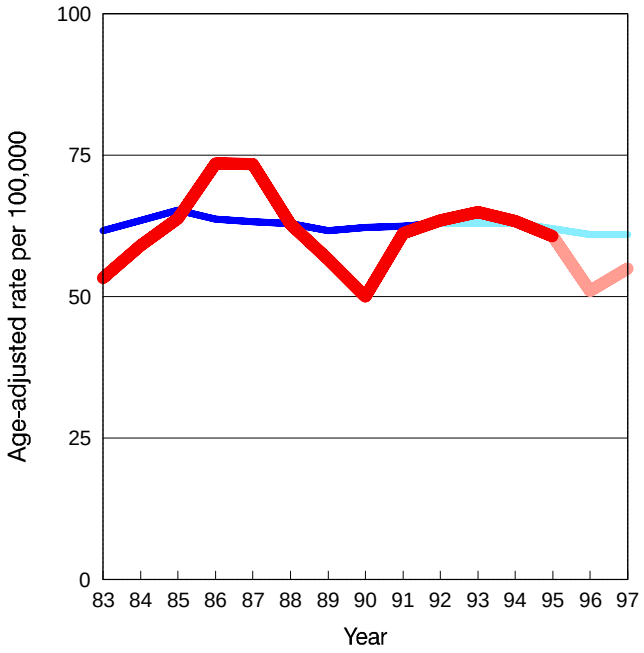
- have a diet high in fat, and low in fibre, fruits and vegetables
- have chronic inflammatory bowel disease
- have obesity and low physical activity
- drink alcohol (increases risk for rectal cancer)

Prevention and Early detection

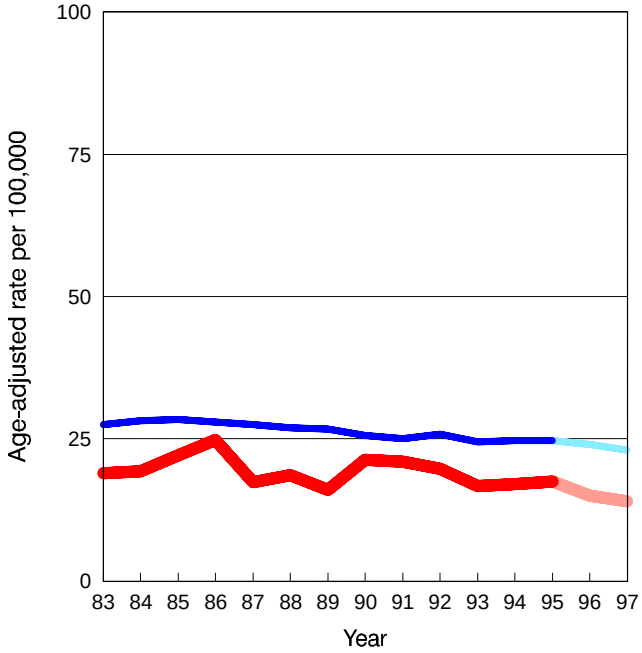
Dietary change probably provides the best approach for reducing colorectal cancer. Possible screening tests such as fecal occult blood, sigmoidoscopy, and digital rectal examination have been evaluated. Canadian guidelines do not recommend population screening.

Colon and Rectum

Trends in **Incidence** - Male

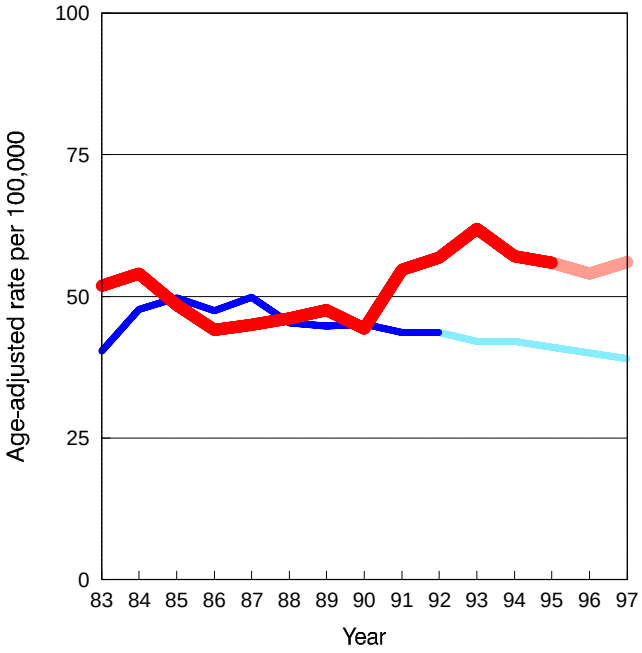


Trends in **Mortality** - Male

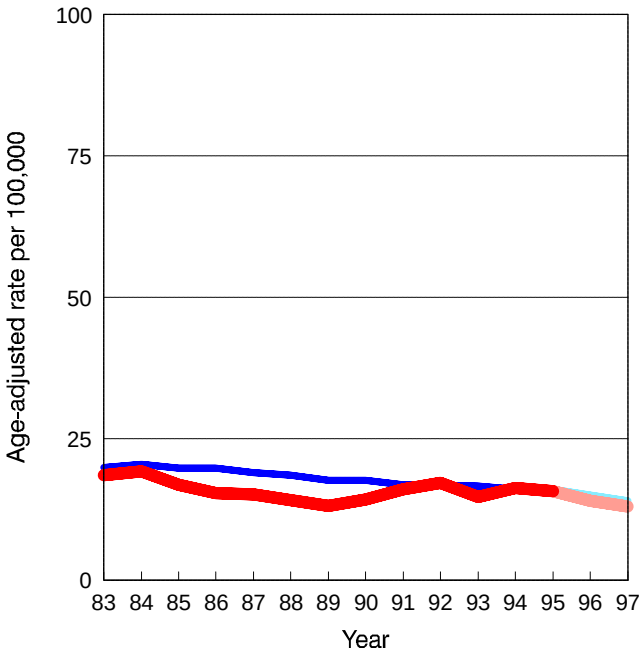


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female



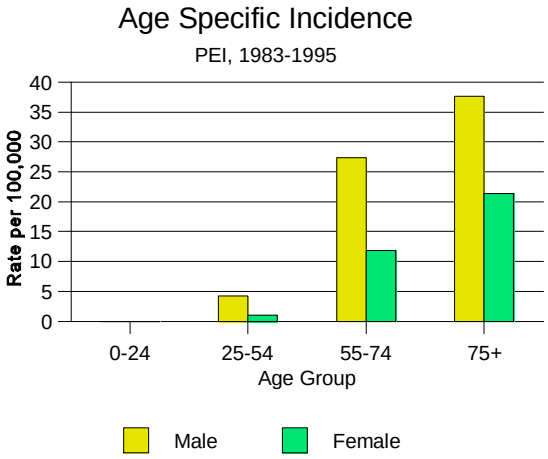
Kidney

Cancer of the kidney includes the body of the kidney (80% of kidney cancers), the renal pelvis or ureter (15%), and nephroblastoma (2%). Although the incidence of cancer of the kidney is rising, mortality has been stable. The five year relative survival is 55%, indicating a fair prognosis.

Age and Gender Influence

Cancer of the kidney is twice as common in men as in women.

The incidence of cancer of the kidney increases with age.



Risk factors

The risk of kidney cancer is higher for persons who:

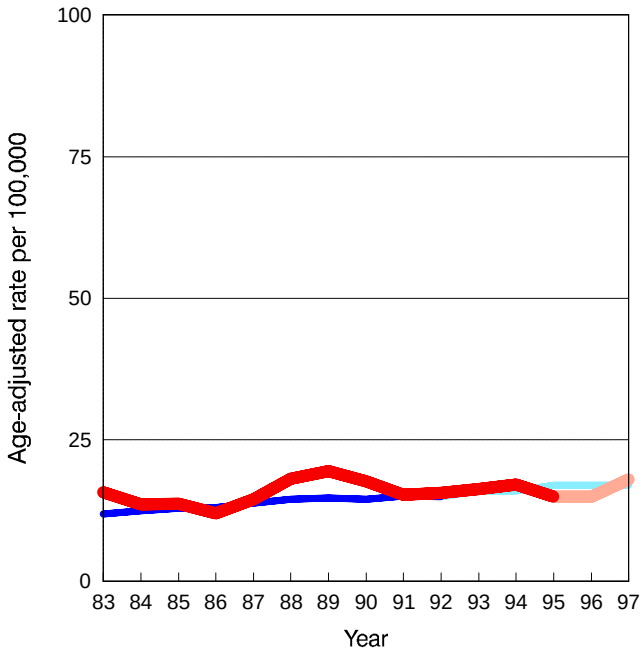
- smoke
- are obese

Prevention and Early Detection

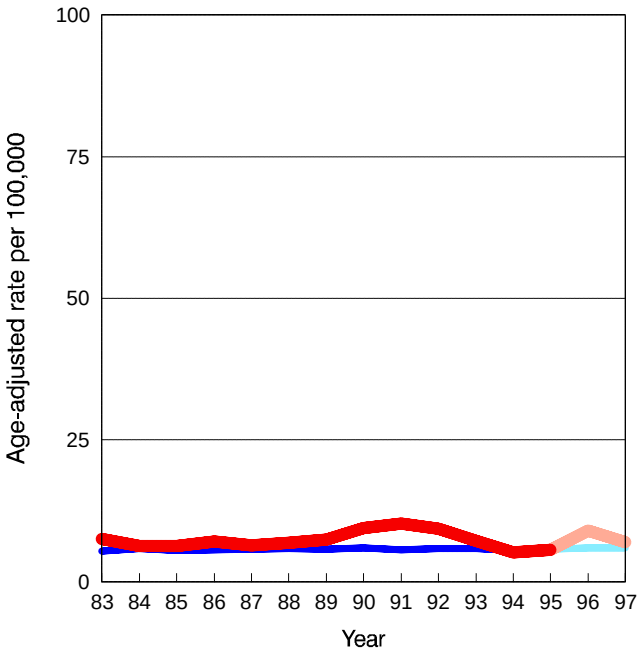
Cancer of the kidney cancer may be reduced by reducing smoking and obesity. There is no effective screening test.

Kidney

Trends in **Incidence** - Male

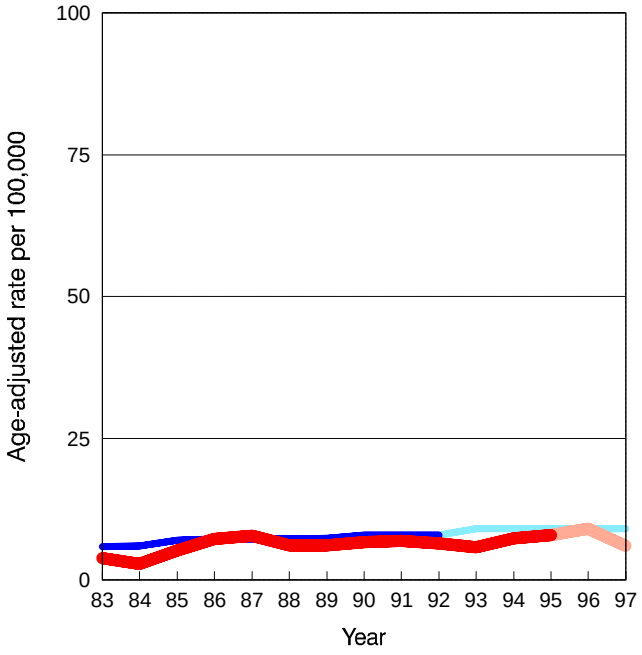


Trends in **Mortality** - Male

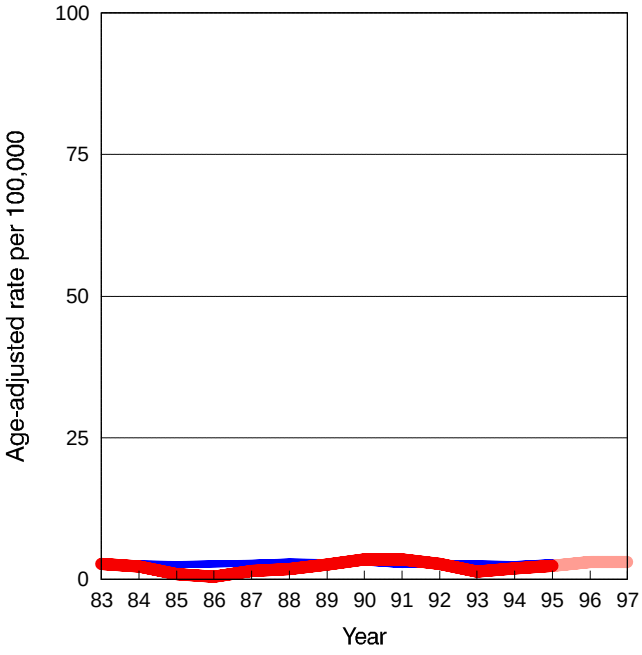


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female



Leukemia

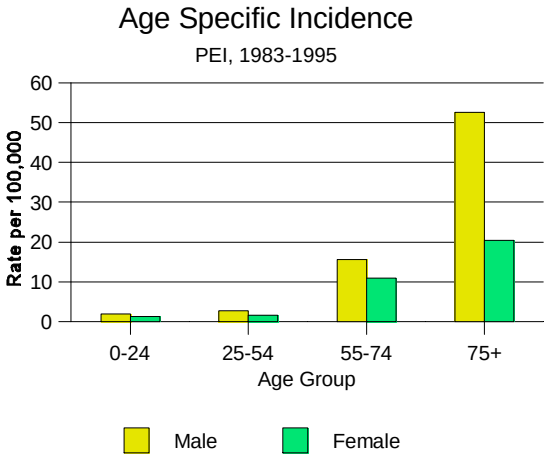
Leukemia is a heterogeneous group of neoplasms of the white blood cells, arising mostly in the bone marrow. Leukemia is generally classified as either acute or chronic (about 50% each) and lymphocytic or non-lymphocytic (50% each). Each type of leukemia has a characteristic way of behaving and requires different treatment.

In Canada, the incidence and mortality rates for leukemia have been stable. PEI has seen a decrease in incidence for both men and women. The five year relative survival is between 35% and 40% overall. For acute leukemia the relative five year survival is only 20%, and for chronic lymphoid leukemia it is about 60%.

Age and Gender Influence

The incidence of leukemia is 60% higher in men than women.

The four major subtypes have different age-at-incidence patterns: chronic lymphocytic leukemia is the most common type and is uncommon before age 40; acute lymphocytic leukemia accounts for most childhood leukemias but also occurs in older adults; acute non-lymphocytic leukemia and chronic myelocytic leukemia occur at all ages and show similar rates of increase with advancing age.



Risk factors

The risk of leukemia is higher for persons who:

- are exposed to ionizing radiation (not for chronic lymphocytic leukemia)
- are exposed to benzene, rubber or petroleum industries (esp. acute non-lymphocytic leukemia)
- smoke (esp. myelocytic leukemia)

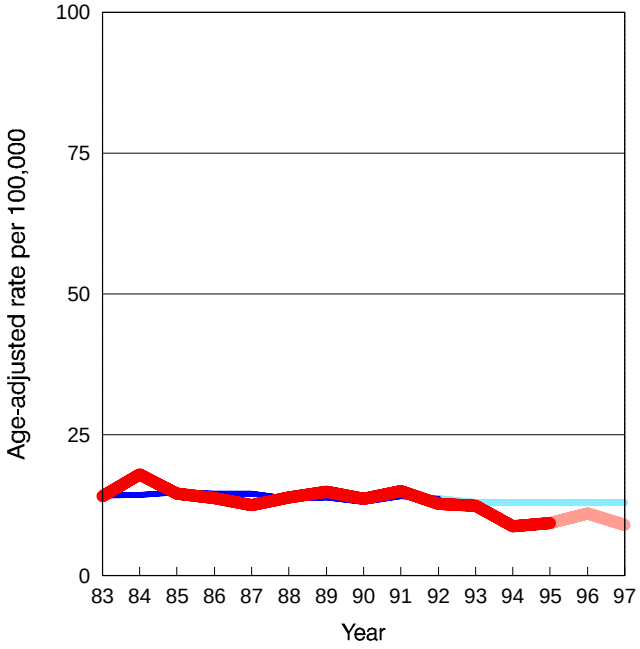
The known risk factors explain only a small proportion of leukemia diagnoses.

Prevention and Early Detection

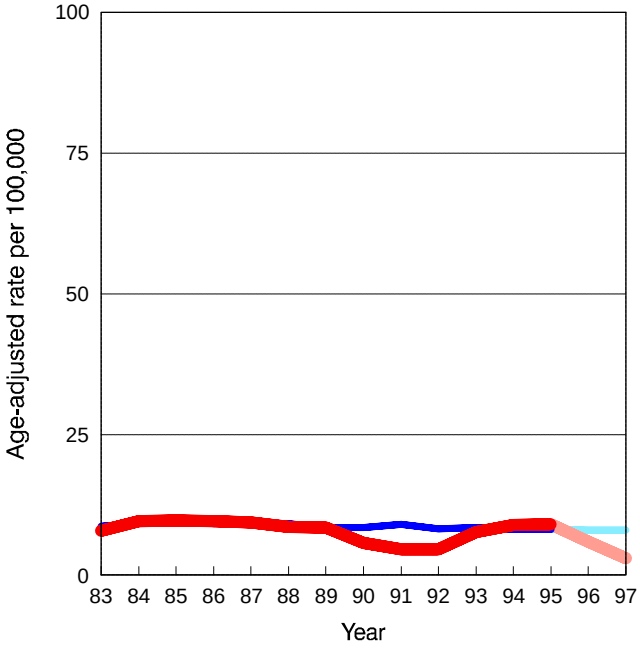
Large gains in primary prevention are unlikely, since the potential contributing causes are not very well understood. Screening for leukemia is not effective.

Leukemia

Trends in **Incidence** - Male

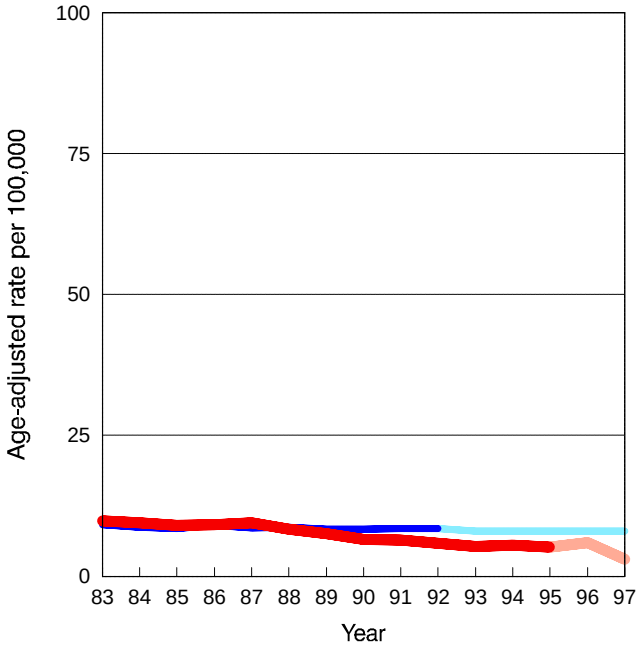


Trends in **Mortality** - Male

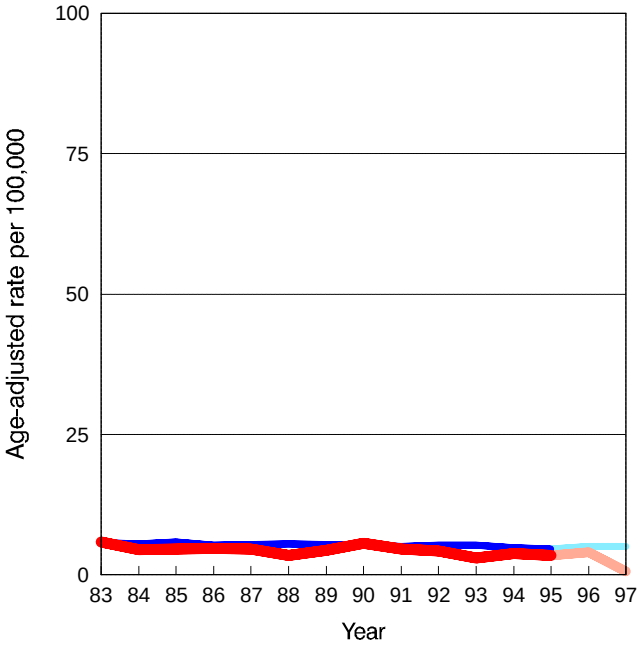


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female



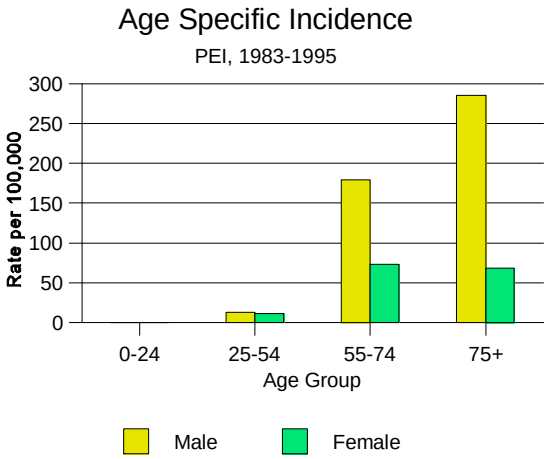
Lung

Lung cancer includes malignant tumours of the trachea, bronchus, and lung. The pleurae are excluded. Lung cancer is the most common cause of cancer deaths in both men and women. Incidence and mortality have been declining for men, and rising for women. In PEI, the rising trend for women is more pronounced than the Canadian trend. The five year relative survival is only 15%, indicating a very poor prognosis.

Age and Gender Influence

Lung cancer is twice as common in men as in women, although the gap is narrowing.

In PEI, the incidence of lung cancer is increasing most rapidly in men 75 years and over, and in women 55 to 74 years of age.



Risk factors

The risk of lung cancer is higher for persons who:

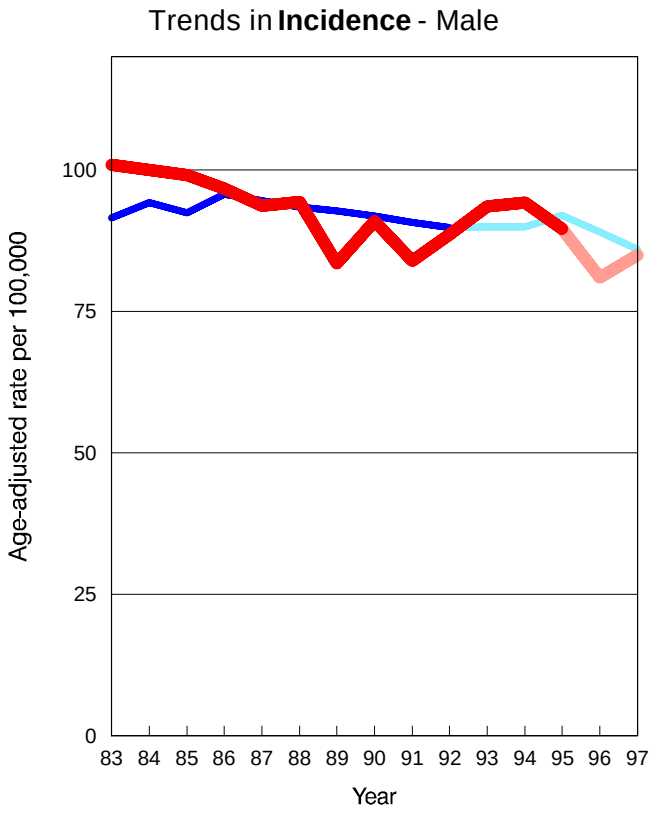
- smoke
- have chronic exposure to radiation, coal tar, asbestos, arsenic, nickel, or chromium

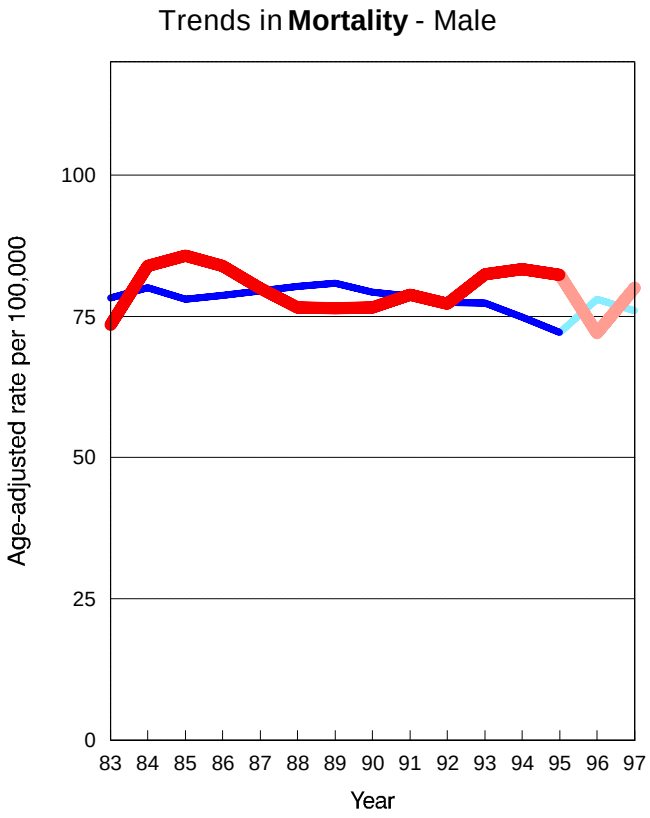
Although air pollution has been investigated as a possible cause, there is no evidence that it increases risk.

Prevention and Early Detection

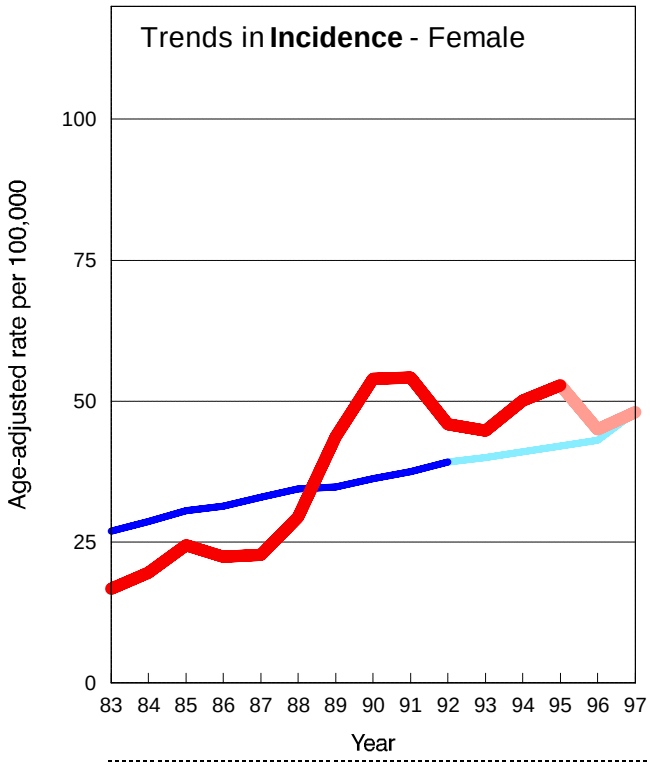
Elimination of smoking would prevent 90% of lung cancers in Canada. Possible screening tests, including periodic chest x-ray and sputum cytology, have been evaluated. No screening test has been shown to reduce the risk of fatal lung cancer.

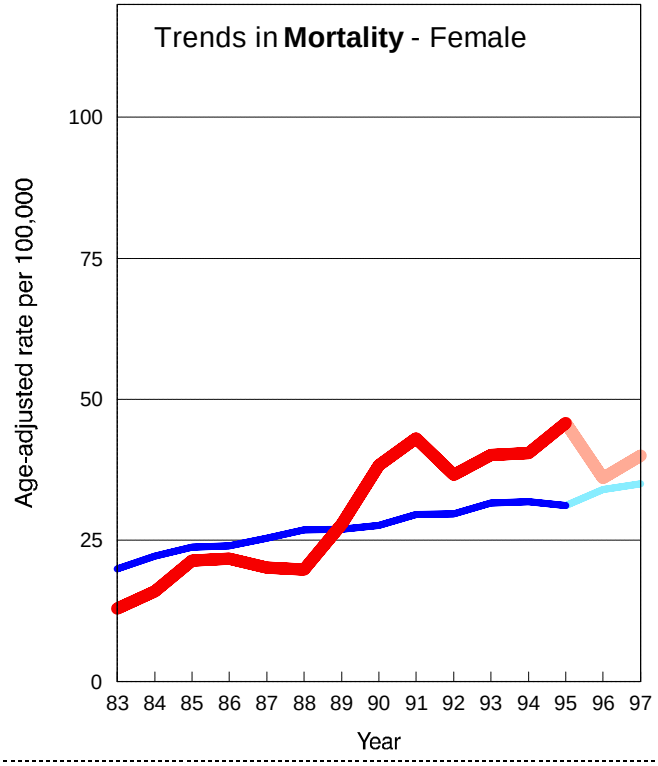
Lung





PEI Canada
lightly shaded lines are estimates





Non-Hodgkin's Lymphoma

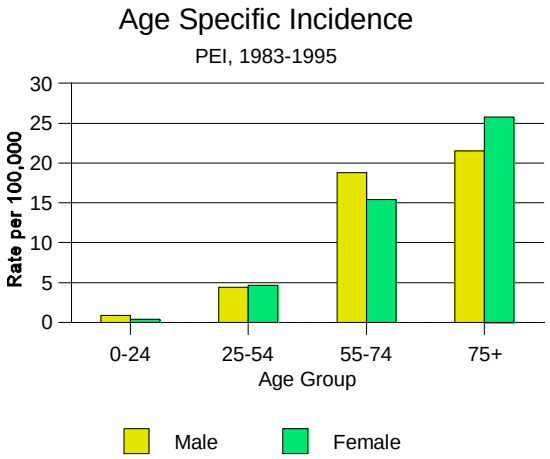
The lymphomas are a group of many cancers of the lymphocytes, the most important cells of the immune system. Non-Hodgkin's lymphomas outnumber Hodgkin's disease by a ratio of over 4:1. Advances in treatment for Hodgkin's disease have improved the 5 year survival to 76%.

Incidence and mortality of non-Hodgkin's lymphomas have been slowly increasing. In PEI, the incidence rate (especially for men) is lower than the Canadian rate. The five year relative survival is about 50%, indicating a fair prognosis.

Age and Gender Influence

In Canada, the incidence of non-Hodgkin's lymphoma is about 40% higher in men than in women. In PEI, the rates are similar.

Lymphomas occur more commonly with advancing age.



Risk factors

The risk of non-Hodgkin's lymphoma is higher for persons who:

- have chronic exposure to ionizing radiation
- have an immune disorder, including AIDS
- have chronic exposure to some chemicals used in the agriculture and forestry industries, such as phenoxy acids, chlorophenols, organic solvents, and insecticides

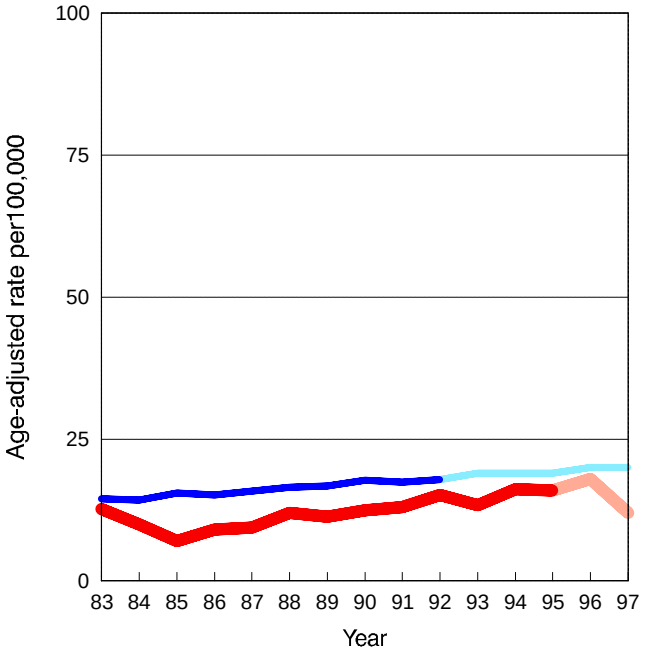
The known risk factors explain only a small proportion of non-Hodgkin's lymphoma.

Prevention and Early Detection

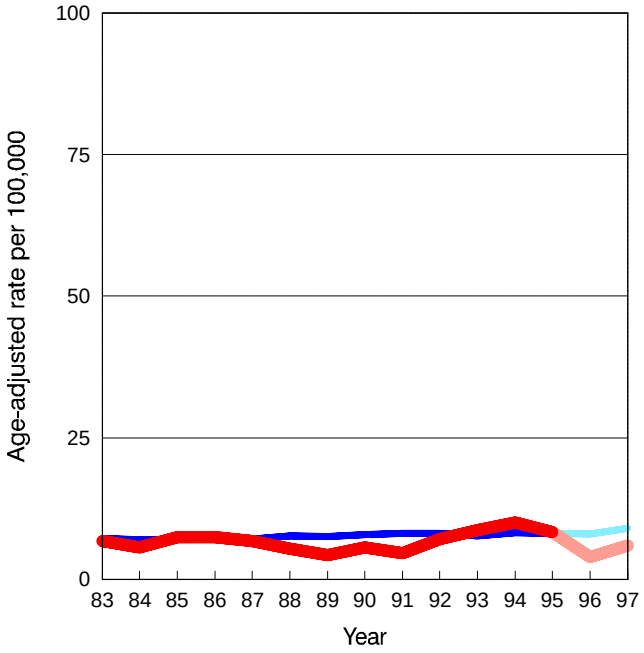
There are no preventive strategies. There are no screening tests for lymphoma.

Non-Hodgkin's Lymphoma

Trends in **Incidence** - Male

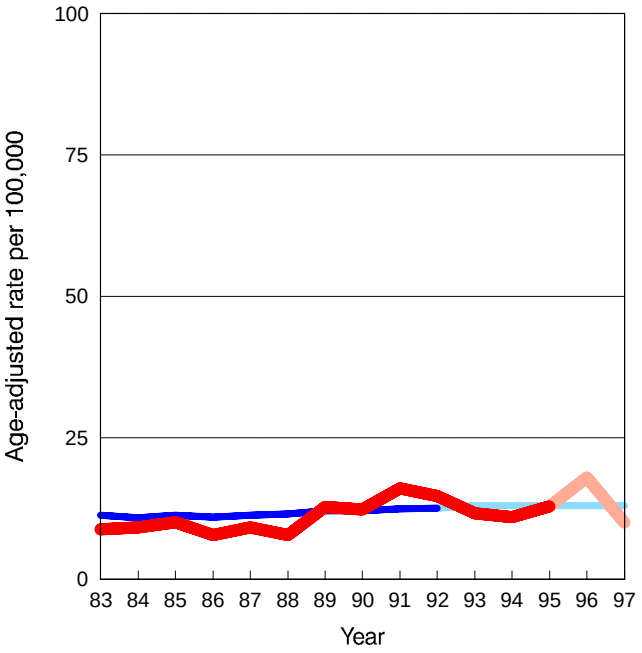


Trends in **Mortality** - Male

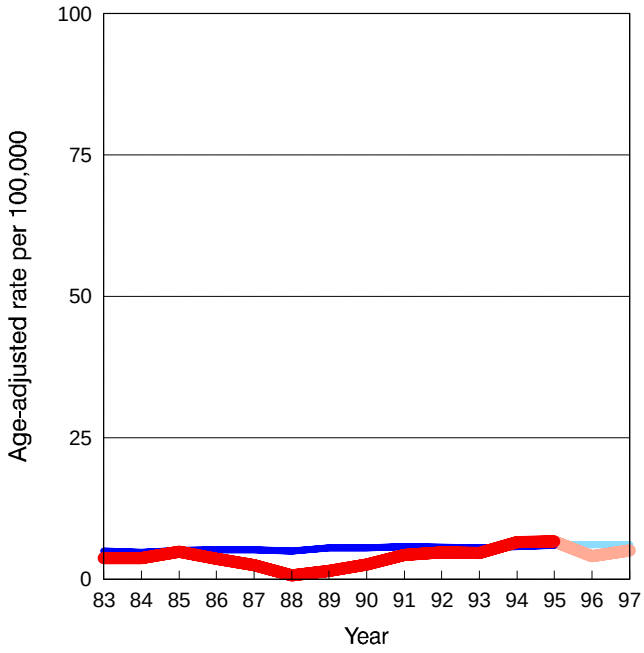


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female

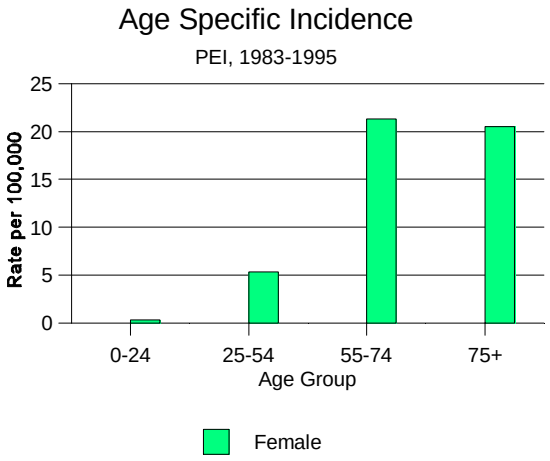


Ovary

Incidence and mortality of ovarian cancer have declined slightly. The five year relative survival is 40%, indicating a fair prognosis.

Age Influence

The incidence of ovarian cancer peaks in the 55 to 74 age group.



Risk factors

The risk of ovarian cancer is higher for women who:

- have a family history of ovarian or breast cancer
- have never been pregnant
- have a diet high in saturated fat

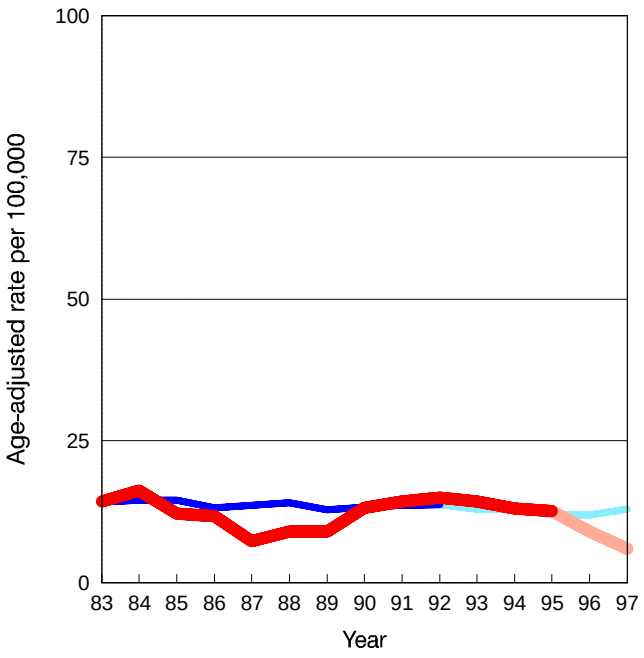
There appears to be no association with the use of estrogen replacement therapy.

Prevention and Early Detection

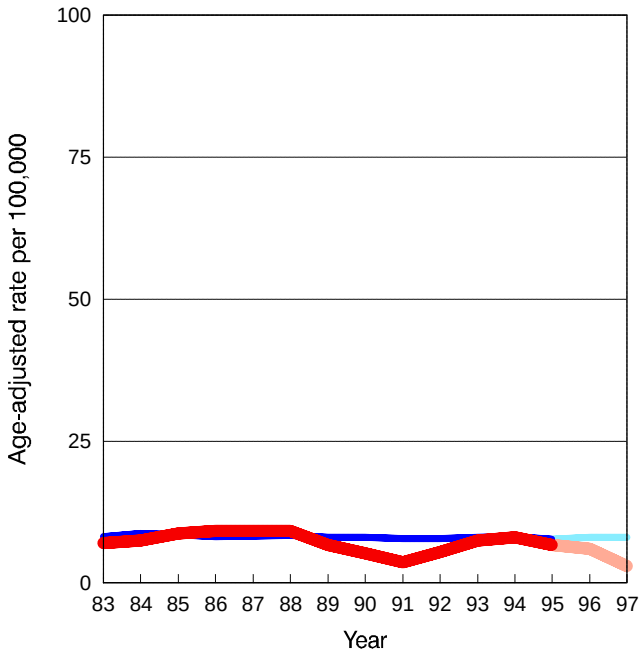
At this time, the risk factors are not understood well enough to consider approaches to primary prevention. Although there are some screening tests available (e.g. serum levels of the antigen CA125 and ultrasound), these tests have not been demonstrated to be valuable for population screening.

Ovary

Trends in **Incidence** - Female



Trends in **Mortality** - Female



PEI Canada

lightly shaded lines are estimates

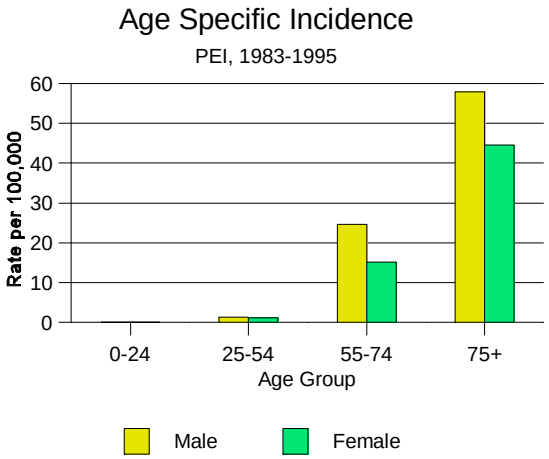
Pancreas

Cancer of the pancreas is a fatal cancer. The five year relative survival is less than 10%, indicating a very poor prognosis. Incidence has been stable in women and declining for men. In PEI, there is no evidence of a declining trend for men.

Age and Gender Influence

Pancreatic cancer is slightly more common in men than in women.

The incidence of pancreatic cancer increases with age.



Risk factors

The risk of pancreatic cancer is higher for persons who:

smoke

have a diet high in carbohydrates and cholesterol, and low in fibre and Vitamin C

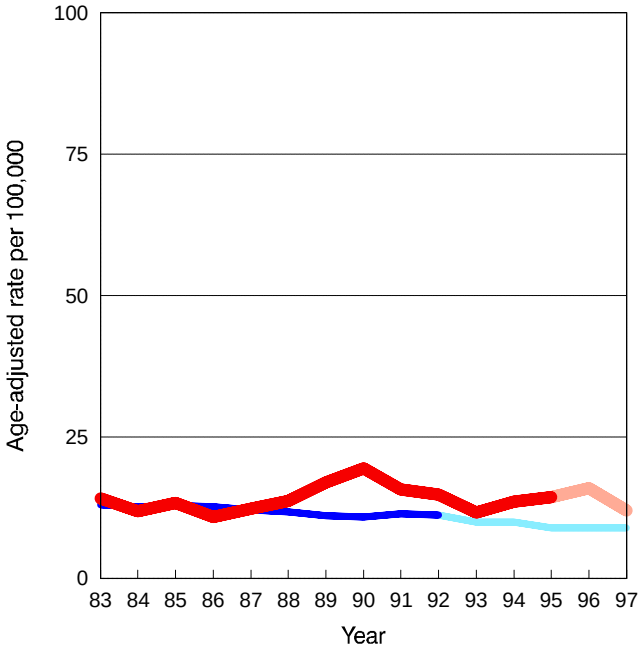
Both chronic pancreatitis and diabetes mellitus are positively associated with cancer of the pancreas, but it is not clear whether these are ‘causes’ or simply symptoms of the cancer.

Prevention and Early Detection

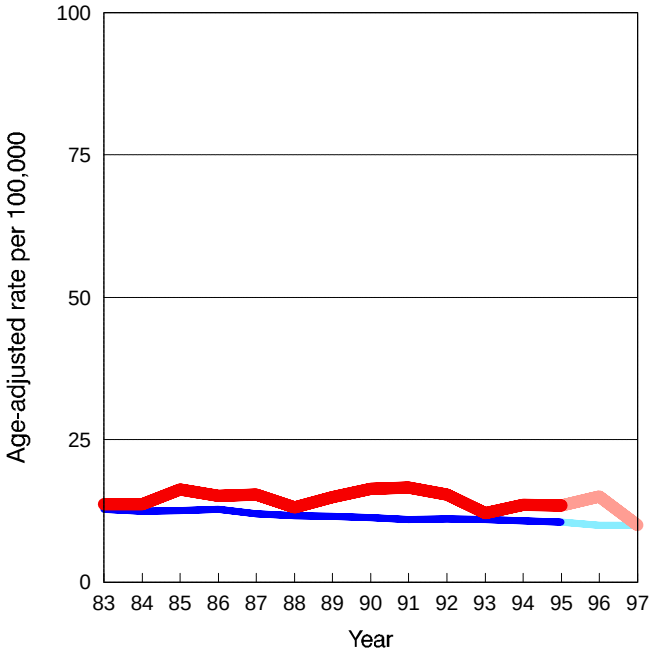
Smoking prevention programs may have some effect in reducing pancreatic cancer. There is no method for early detection, and no effective treatment.

Pancreas

Trends in **Incidence** - Male

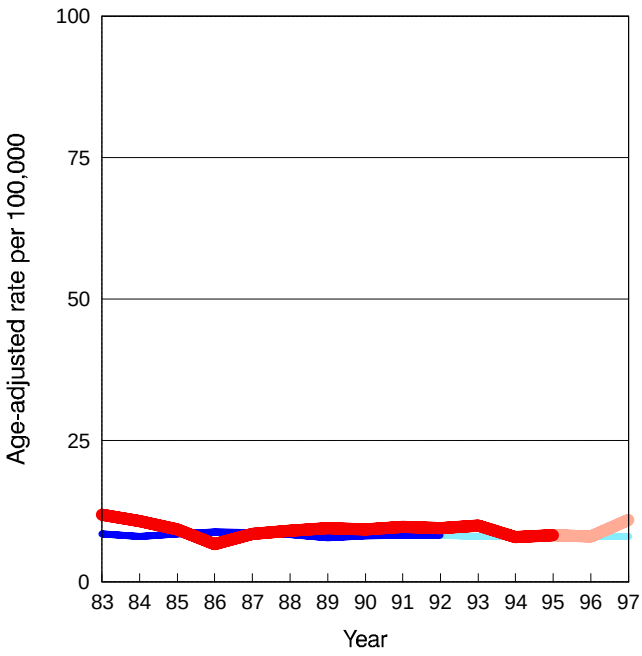


Trends in **Mortality** - Male

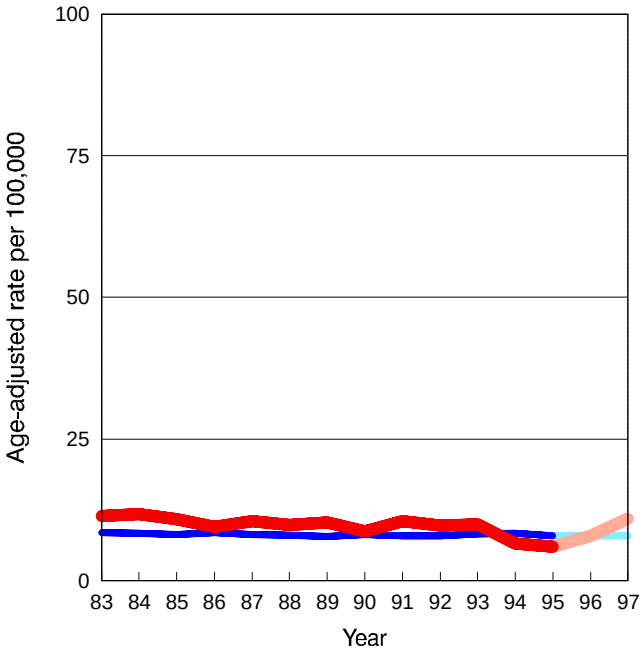


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female

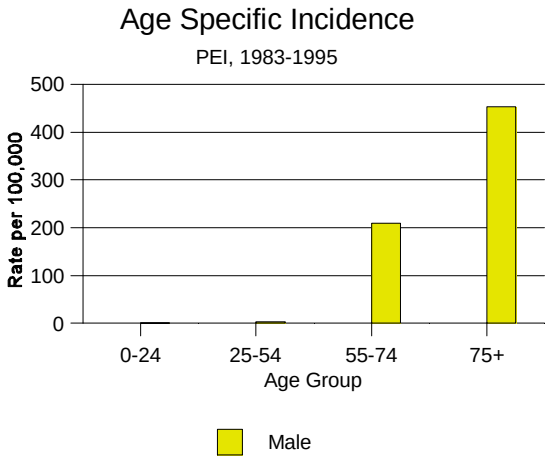


Prostate

Prostate cancer is currently the most commonly diagnosed cancer in Prince Edward Island men. The incidence of prostate cancer has risen dramatically, and mortality has increased at a much slower rate. The five year relative survival is 70%, indicating a good prognosis.

Age Influence

The chance of developing prostate cancer increases with age. In PEI, incidence has been increasing in men 55 and over.



Risk factors

The risk of prostate cancer is higher for men who have:

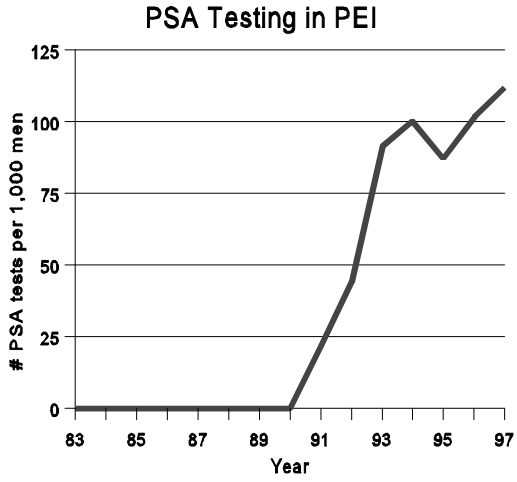
- a diet high in fat
- a family history of prostate cancer

The causes of prostate cancer are largely unknown. The effect of factors such as vasectomy, sexually transmissible agents, cigarette smoking, alcohol, ionizing radiation, and exposure to cadmium is unclear.

Early Detection and Treatment

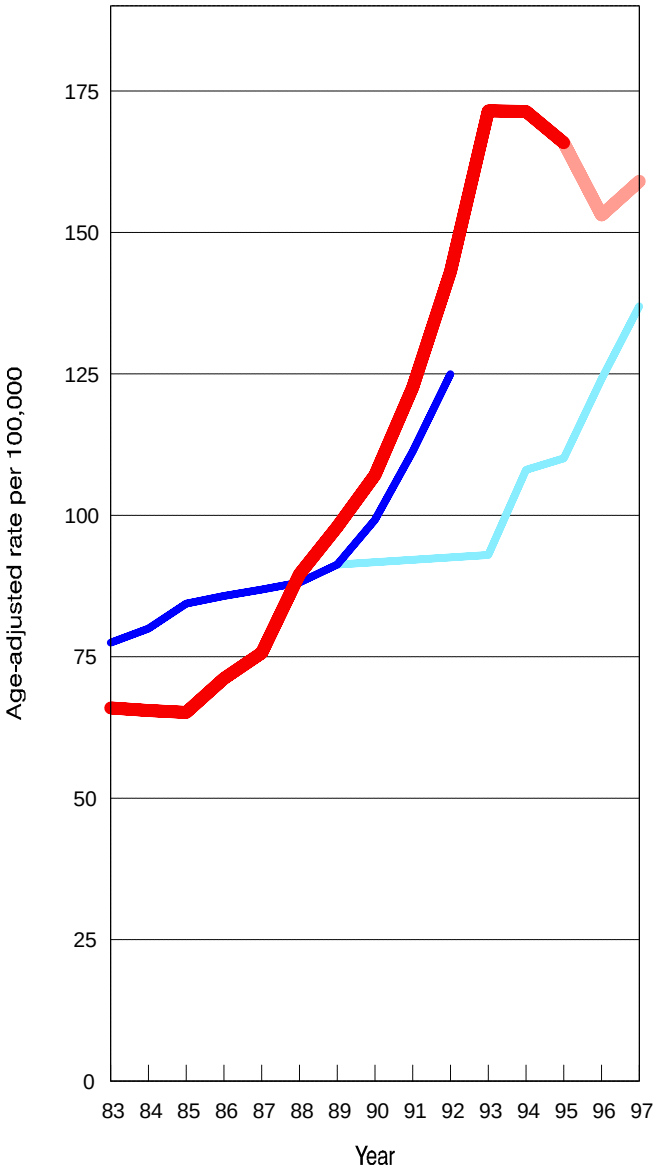
Reduction in dietary fat may reduce prostate cancer. Possible screening tests such as digital rectal examination, prostate specific antigen (PSA), and prostatic ultrasound have been evaluated. The benefit of these tests on survival is unproven.

The increased incidence of prostate cancer prior to 1991 is partly due to increased diagnostic efforts for enlarged prostate.
PSA testing became available in PEI in 1991. This corresponds to the period of dramatic increase in the incidence of previously undiagnosed prostate cancer. Some diagnosed prostate cancers will not cause any medical problems. For example, it is estimated that 43% of men aged 80 have asymptomatic prostate cancer that will not cause any medical problems in their lifetime.

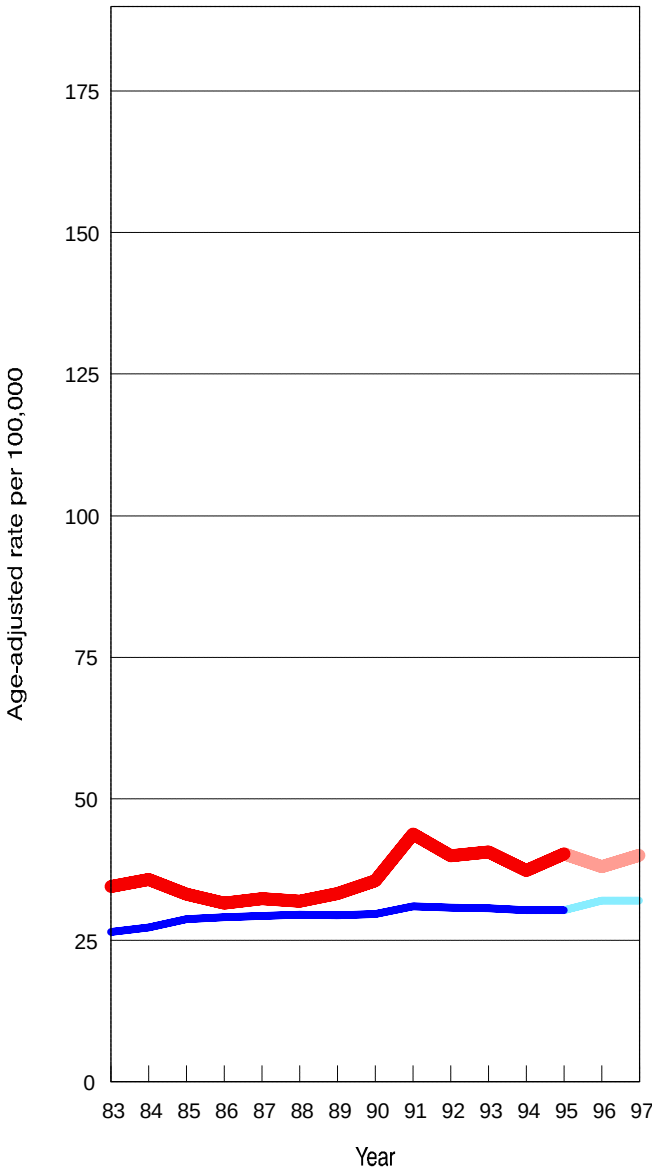


Prostate

Trends in **Incidence** - Male



Trends in **Mortality** - Male



PEI Canada
lightly shaded lines are estimates

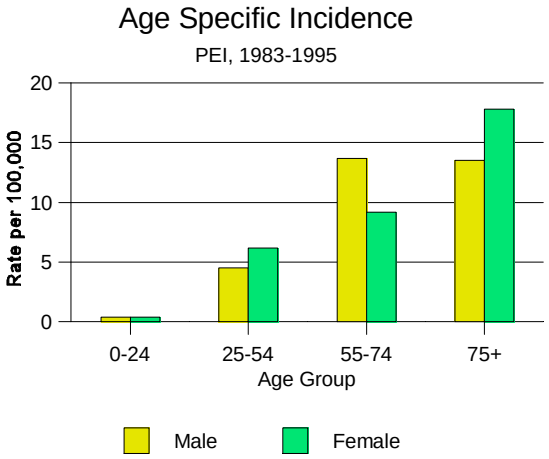
Skin Melanoma

Melanoma is a type of skin cancer that begins in the melanocytes, the cells that make the pigment of the skin. Melanoma is one of the more common cancers in young adults. The incidence of skin melanoma has been rising in Canada and in white populations around the world. In PEI, the increase is more predominant for women than for men. Although it is the most serious type of skin cancer, melanoma has a good prognosis, with a five-year relative survival rate of 79% in males and 89% in females.

Age and Gender Influence

The incidence of skin melanoma is similar in men and women.

The rate of skin melanoma does not usually increase after middle age.
In PEI, the incidence of skin melanoma is high in women 75 years of age and over.



Risk factors

The risk of skin melanoma is higher for persons who:

- have chronic exposure to ultraviolet radiation in sunlight or sunlamps
- tend to burn rather than tan on exposure to the sun
- have many freckles or moles
- have a rare familial inherited risk

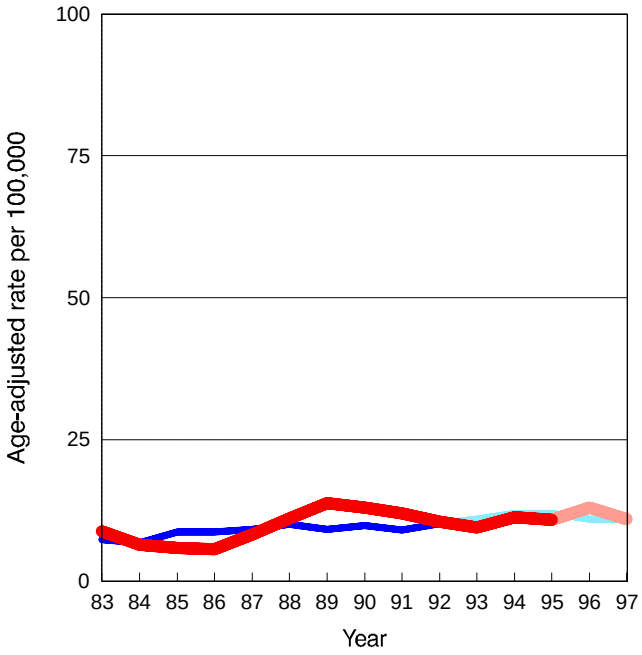
Prevention and Early Detection

Melanoma can be reduced by avoiding peak exposure to ultraviolet radiation. When exposure is necessary, people should wear a shirt, a hat, and use sunscreen with a sun-protection-factor (SPF) of at least 15.

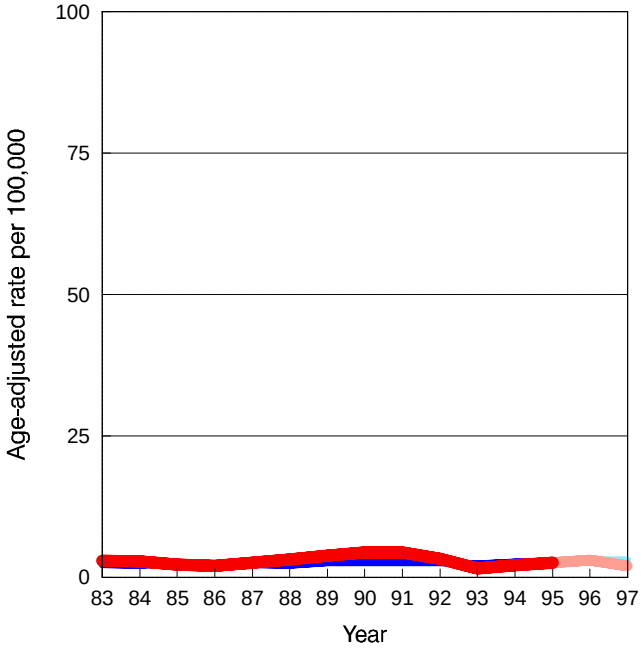
Individuals at high risk of melanoma can be identified on the basis of pigmentation characteristics. The effectiveness of this screening has not been demonstrated.

Skin Melanoma

Trends in **Incidence** - Male

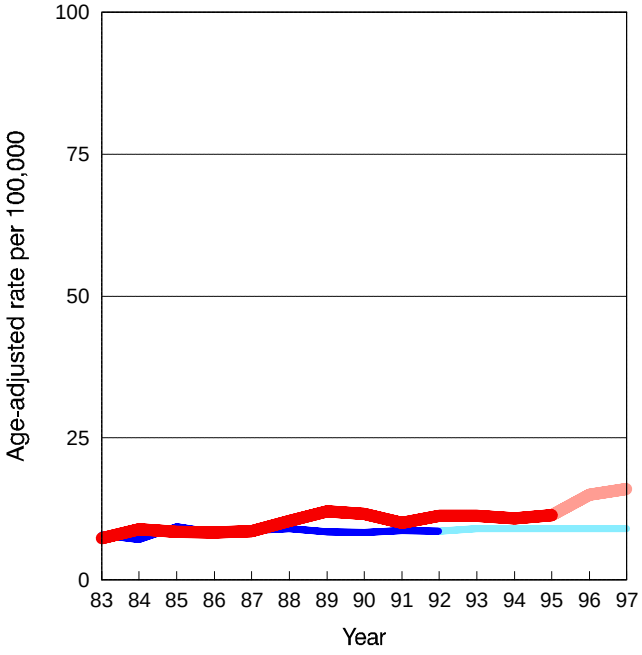


Trends in **Mortality** - Male

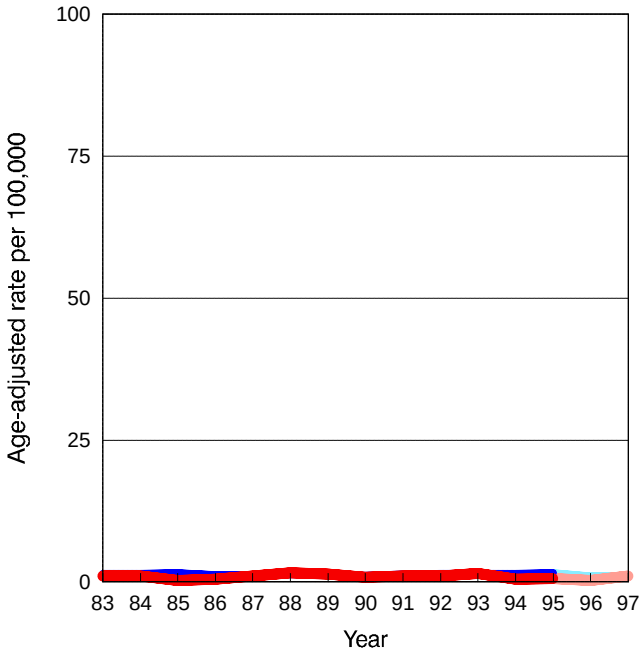


PEI Canada
lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female



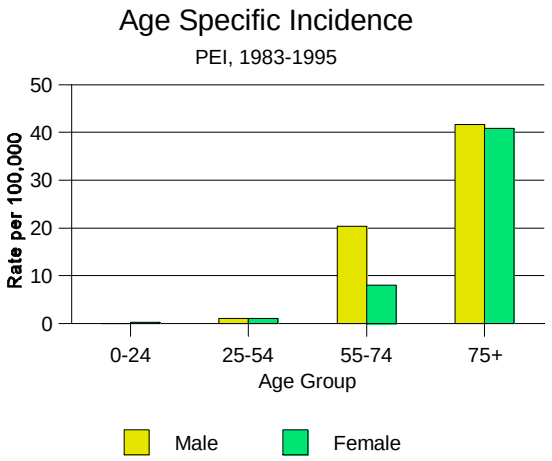
Stomach

Incidence and mortality of stomach cancer have been declining significantly in the past century. In PEI, the incidence for men is lower than the Canadian rate. The five year relative survival is only 22% to 26%, indicating a poor prognosis.

Age and Gender Influence

In Canada, stomach cancer is twice as common in men than in women. In PEI, the incidence in men is only slightly higher than for women.

Stomach cancer is more common in older age groups. In PEI, the incidence of stomach cancer is unusually high in women 75 years of age and over.



Risk factors

The risk of stomach cancer may be higher for persons who:

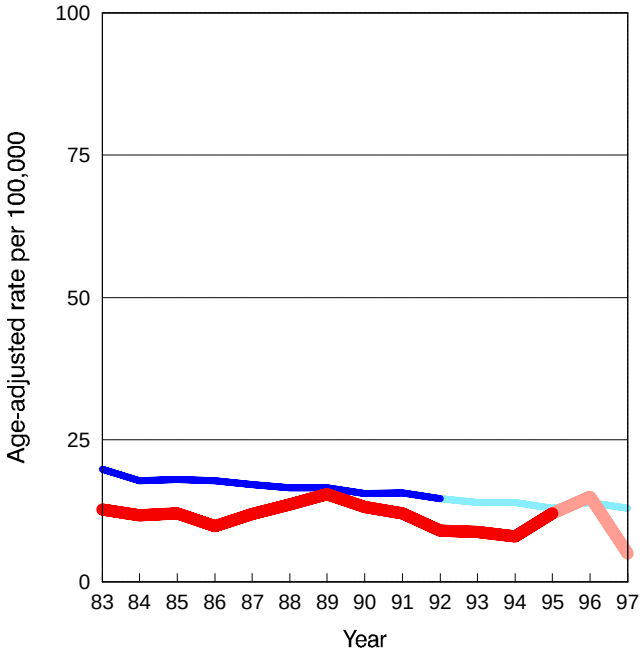
- eat a diet low in fruits and vegetables and beta carotene
- consume nitrates in drinking water and in pickled or cured foods
- use alcohol and tobacco
- have infection with *Helicobacter pylori* bacteria
- have a family history of stomach cancer
- chronic exposure to asbestos, dioxin, steel polishing, rubber, coal mining, ethylene dichloride and ethylene oxide, petrochemicals, or wood dust

Prevention and Early Detection

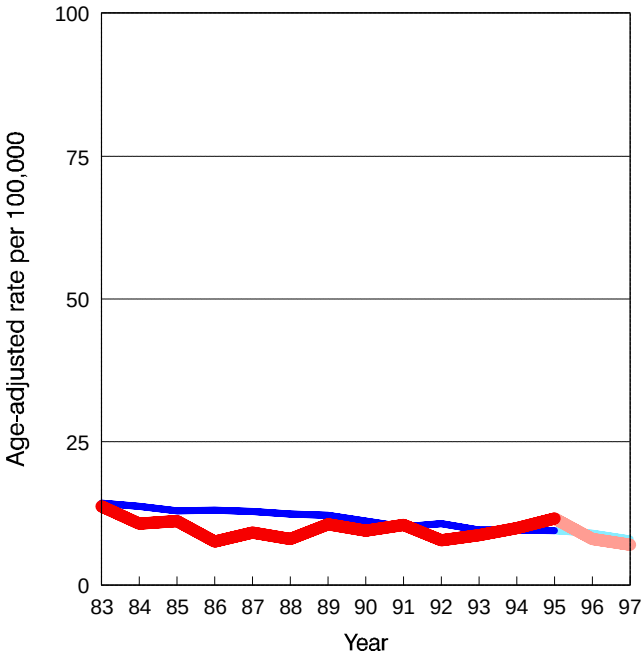
Prevention focuses on the year-round consumption of fruits and vegetables, and restriction of salted, pickled and smoked foods. Screening for stomach cancer has not demonstrated effectiveness, and is not recommended as public health policy, particularly in Canada and Prince Edward Island where the incidence is low.

Stomach

Trends in **Incidence** - Male



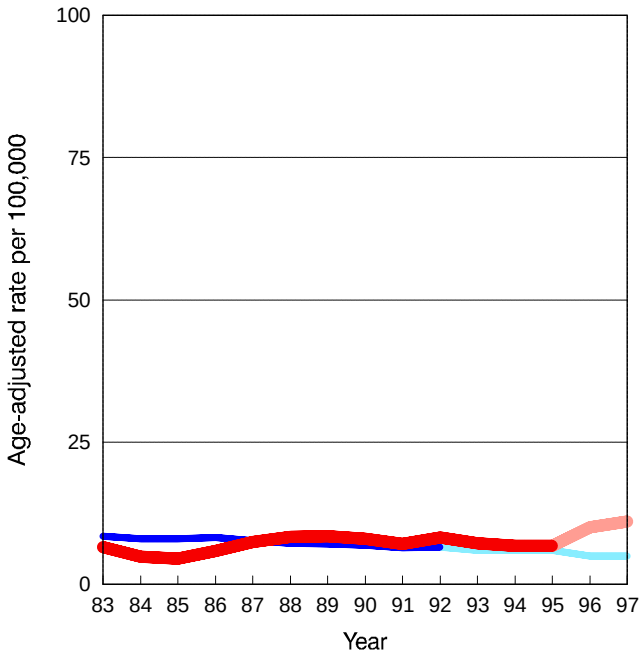
Trends in **Mortality** - Male



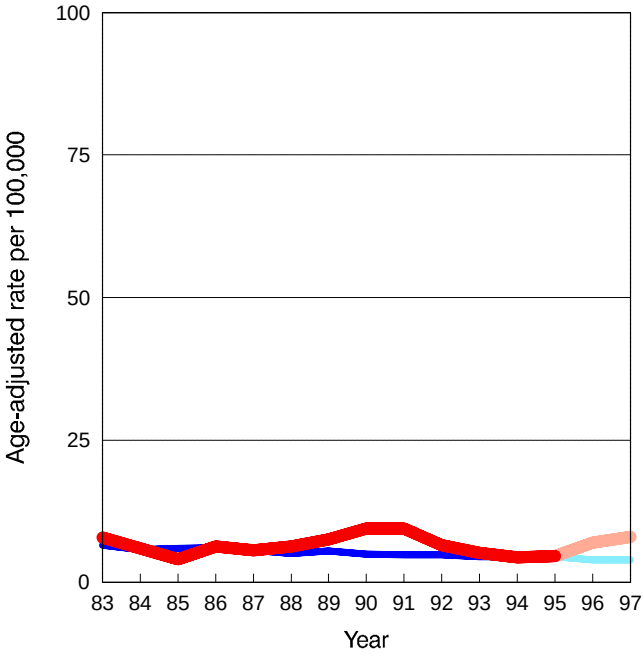
PEI Canada

lightly shaded lines are estimates

Trends in **Incidence** - Female



Trends in **Mortality** - Female

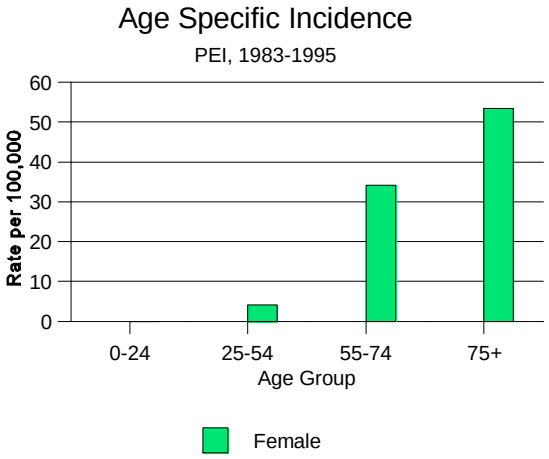


Uterus

Cancer of the uterus involves the endometrium (lining) and/or the myometrium (muscle). Incidence of uterine cancer has been declining, with smaller declines in mortality. The five year relative survival is 80%, indicating a very good prognosis.

Age Influence

The risk of uterine cancer increases with age, especially around menopause.



Risk factors

The risk of uterine cancer is higher for women who:

- use estrogen replacement therapy without added progesterone for five or more years
- use birth control pills containing only estrogen (no longer used)
- have a history of breast cancer, ovarian cancer or endometrial hyperplasia
- have never been pregnant
- are obese

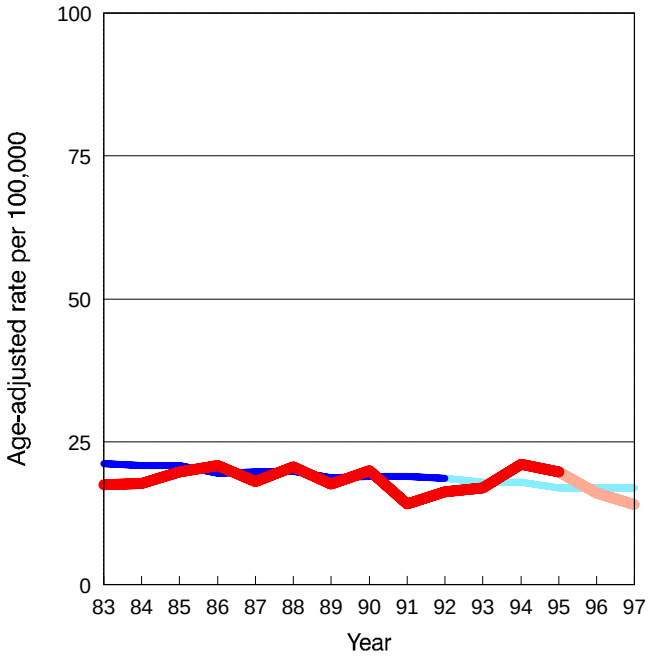
In approximately half of the cases of endometrial cancer, there are no identified risk factors, apart from the woman's age.

Prevention and Early Detection

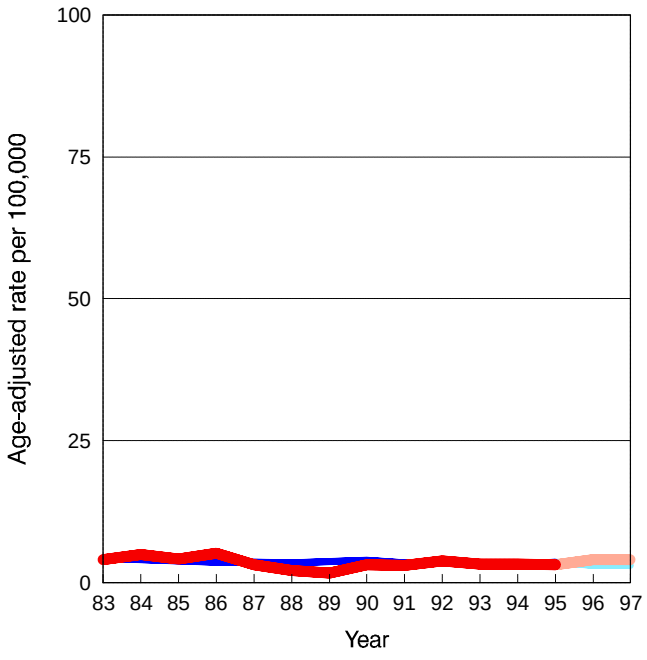
Weight loss among obese post-menopausal women and the use of combination oral contraceptives have the most potential for reducing uterine cancer. There are no methods of early detection.

Uterus

Trends in **Incidence** - Female



Trends in **Mortality** - Female



PEI Canada

lightly shaded lines are estimates

Childhood Cancer

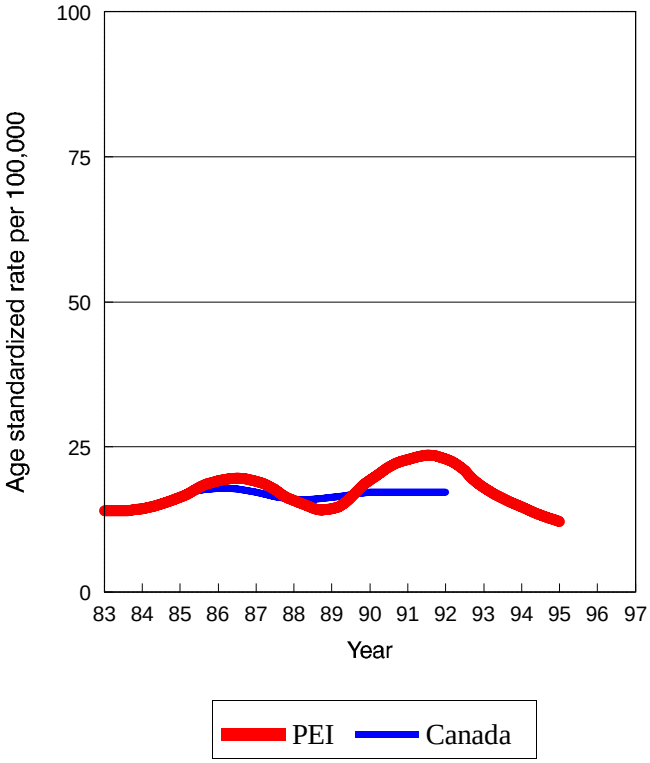
Cancer is relatively rare in children and adolescents, compared to the frequency of cancer in adults. In PEI, over the 13 year period 1983 to 1995, there were 82 children and teenagers less than 20 years of age diagnosed with cancer. The five-year survival rate is 71% for childhood cancers, indicating a good prognosis compared with 50% for all adult cancers. Survival has improved significantly over several decades primarily due to improved treatment.

Childhood cancers are grouped differently than for adults. Categories are based on disease morphologies more than organ site, using the Manchester/Marsden Classification. The most common categories are leukemia, lymphoma, brain tumours, and sarcoma. Other cancer types are carcinoma, sympathetic nervous system tumours, germ-cell and gonadal neoplasms, retinoblastoma, renal tumours, hepatic tumours, and other/unspecified cancers.

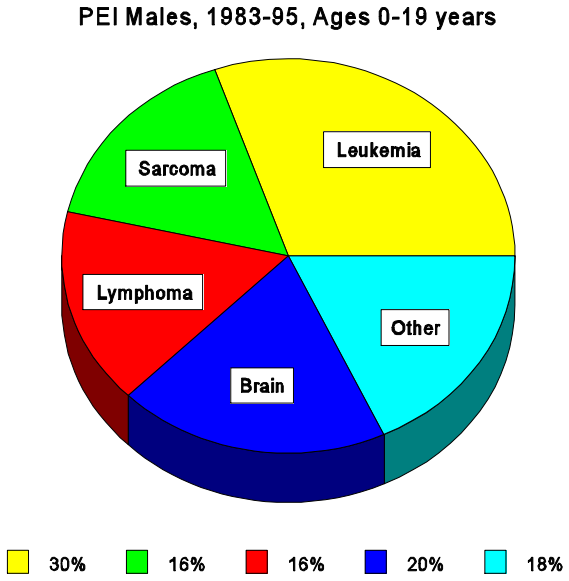
Childhood cancers are slightly more common in males than in females. The incidence of childhood cancers has remained stable over the years.

Childhood Cancer

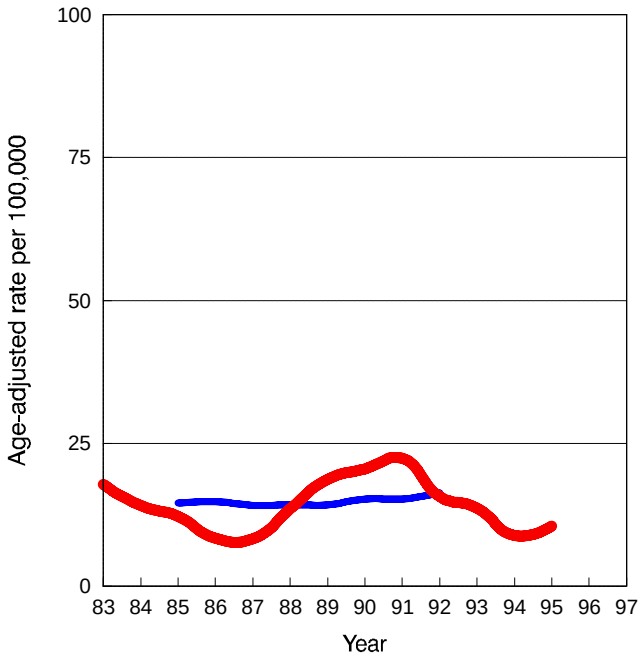
Trends in **Incidence** - Male



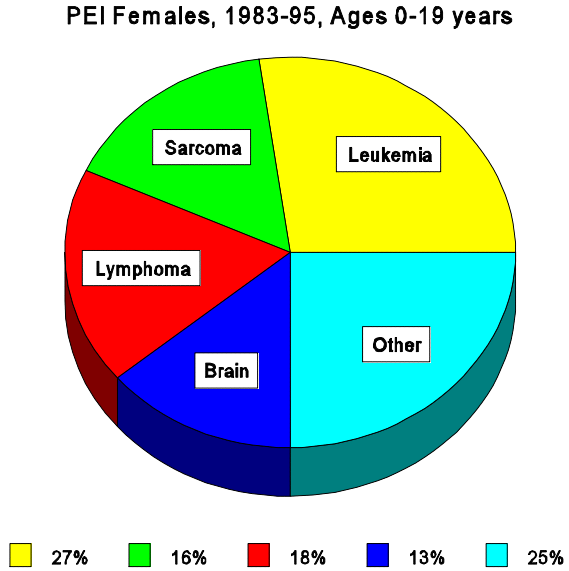
Incidence by Category



Trends in **Incidence** -Female



Incidence by Category



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"Causes of Death", Statistics Canada, Cat. 84-208.

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Appendix 1. Description of Cancer Sites

SITE:	DESCRIPTION:	ICDO-2 CODES	ICD-9 CODES
All Sites	all primary sites of malignant neoplasms; exclude metastatic sites and exclude non-melanoma skin cancer	C00-C80, exclude C44 (M805-M811)	140-208, exclude 173
Bladder	urinary bladder	C67	188
Brain	central nervous system including meninges, brain, spinal cord, cranial nerves (includes benign and malig.)	C70-C72	191-192
Breast	female breast	C50	174
Cervix	cervix, including cervical stump	C53	180
Colon and Rectum	colon, rectum, rectosigmoid junction, anus	C18-C21	153-154
Kidney	kidney, ureter, unspecified urinary organs	C64-C66, C68	189
Leukemia	lymphoid, myeloid, monocytic, other leukemias	M980-M994 (us. C421)	204-208
Lung	trachea, bronchus, lung	C33, C34	162
N-H Lymphoma	Non-Hodgkin's Lymphoma: lymphosarcoma, reticulosarcoma, other lymphoid and histiocytic tissue	M959-M964, M967-M972 (us. C77)	200, 202
Ovary	ovary	C56	183
Pancreas	pancreas including ducts, Islets of Langerhans	C25	157
Prostate	prostate gland	C61	185
Skin Melanoma	malignant melanoma of skin	C44 (M872-M879)	172
Stomach	stomach including fundus, body, pylorus	C16	151
Uterus	uterus including endometrium, myometrium, fundus, body	C54, C55	179,182
Smoking-Related Cancers	upper airway: lip, tongue, mouth, oropharynx (excludes salivary glands, nasopharynx)	C00-C14, exclude C079-C089, C110-C119	140-149, exclude 142 & 147
	esophagus	C15	150
	lung, bladder, kidney, pancreas		

Appendix 2. Data Tables

A2-1. PEI Cancer Incidence for all cancer sites, by sex and year

Year	total # new cases	Males # new cases	Males age-adjusted ‡ incidence rate	Females # new cases	Females age-adjusted ‡ incidence rate
1983	452	239	411.3	213	315.7
1984	477	261	445.0	216	308.8
1985	464	243	409.0	221	316.7
1986	414	229	379.2	185	261.8
1987	508	290	472.1	218	301.4
1988	526	270	436.4	256	347.7
1989	552	305	490.2	247	336.9
1990	586	308	486.8	278	382.4
1991	553	276	432.3	277	363.4
1992	613	320	497.6	293	376.2
1993	594	346	535.4	248	320.9
1994	643	340	516.2	303	393.3
1995	611	333	503.6	278	353.8
1996	680	340	481.0	340	403.0
1997	670	360	522.0	310	387.0

‡ rates exclude non-melanoma skin cancer and are adjusted to the age distribution of the 1991 Canadian population.

estimated numbers

A2-2. PEI Cancer Deaths for all cancer sites, by sex and year

Year	Total # of cancer deaths	Males # of cancer deaths	Males age-adjusted ‡ cancer mortality rate	Females # of cancer deaths	Females age-adjusted ‡ cancer mortality rate
1983	245	127	220.7	118	163.8
1984	256	152	258.9	104	141.8
1985	272	158	266.6	114	147.2
1986	277	148	247.1	129	175.7
1987	262	159	253.0	103	146.0
1988	247	151	243.6	96	119.1
1989	258	147	235.4	111	145.1
1990	306	169	267.2	137	169.7
1991	303	168	262.1	135	165.8
1992	299	176	273.7	123	156.7
1993	274	149	227.8	125	148.9
1994	311	173	265.0	138	168.0
1995	303	174	262.0	129	157.0
1996	320	180	249.0	140	158.0
1997	310	170	255.0	140	166.0

‡ rates exclude non-melanoma skin cancer and are adjusted to the age distribution of the 1991 Canadian population.

estimated numbers

A2-3. PEI Cancer Incidence 1983 to 1995, by site and sex

Site	total # new cases	Male # new cases	Male age-adjusted ‡ incidence rate	Female # new cases	Female age-adjusted ‡ incidence rate
Bladder	276	199	24.4	77	7.2
Brain	107	54	6.6	53	5.7
Breast	884	7	-	877	95.9
Cervix	96	-	-	96	11.4
Colorectal	1045	506	60.5	539	51.6
Kidney	187	125	14.9	62	6.1
Leukemia	183	111	11.2	72	7.4
Lung	1099	754	93.3	345	37.4
N-H Lymphoma	202	99	12.3	103	11.0
Ovary	116	-	-	116	12.8
Pancreas	213	115	14.1	98	9.1
Prostate	889	889	108.1	-	-
Skin Melanoma	164	77	9.6	87	10.0
Stomach	166	90	11.1	76	6.8
Uterus	179	-	-	179	18.5
Other Sites	1187	734	92	453	46
All Sites	6993	3760	462.7	3233	336.9

‡ rates exclude non-melanoma skin cancer and are adjusted to the age distribution of the 1991 Canadian population.

A2-4. PEI Cancer Death 1983 to 1993, by site and sex

Year	Total # of cancer deaths	Male # of cancer deaths	Male age-adjusted ‡ cancer mortality rate	Female # of cancer deaths	Female age-adjusted ‡ cancer mortality rate
Bladder	65	44	5.4	21	1.7
Brain	74	41	5.1	33	3.7
Breast	279	*	-	279	29.4
Cervix	40	-	-	40	4.4
Colorectal	330	153	18.9	177	16.3
Kidney	83	57	7.0	26	2.3
Leukemia	114	66	8.2	48	4.5
Lung	948	666	81.6	282	29.9
N-H Lymphoma	95	57	6.9	38	4.0
Ovary	66	-	-	66	7.2
Pancreas	218	120	14.7	98	9.2
Prostate	297	297	36.4	-	-
Skin Melanoma	31	22	2.8	9	1.7
Stomach	149	79	9.8	70	6.2
Uterus	35	-	-	35	3.2
Other Sites	789	449	56	340	30
All Sites	3613	2051	252.6	1562	154.2

* not available

‡ rates exclude non-melanoma skin cancer and are adjusted to the age distribution of the 1991 Canadian population.

A2-5. PEI Cancer Incidence 1983 to 1995, by age group and sex

Age	Total # new cases	Male # new cases	Male incidence rate	Female # new cases	Female incidence rate
00-24	117	69	20.5	48	15.0
25-34	144	55	41.2	89	65.5
35-44	321	114	95.6	207	174.5
45-54	673	280	330.1	393	463.9
55-64	1358	769	1112.8	589	838.7
65-74	2127	1304	2344.7	823	1270.4
75-84	1629	896	2999.4	733	1732.6
85+	624	273	3364.9	351	2114.1
All ages	6993	3760	448	3233	379

A2-6. PEI Cancer Death 1983 to 1995, by age group and sex

Age	Total # cancer deaths	Male # cancer deaths	Male mortality rate	Female # cancer deaths	Female mortality rate
00-24	34	26	7.7	8	2.5
25-34	28	17	12.8	11	8.6
35-44	100	33	28.0	67	56.6
45-54	278	155	187.4	123	150.0
55-64	608	390	559.1	218	310.5
65-74	1097	651	1156.8	446	682.9
75-84	971	570	1885.7	401	967.3
85+	497	209	2550.2	288	1746.6
All ages	3613	2051	245	1562	183

A2-7. PEI Population Estimates, by sex and year

Year	Total	Males	Females
1983	124168	61722	62446
1984	124997	62113	62884
1985	125826	62504	63322
1986	126655	62895	63760
1987	129019	64183	64836
1988	129744	64456	65288
1989	130567	64783	65784
1990	131037	64928	66109
1991	130826	64746	66080
1992	131631	65053	66578
1993	133173	65894	67279
1994	134551	66502	68049
1995	135606	66968	68638
1996	137312	67696	69616
1997	137000	68000	69000

A2-8. PEI Population Pyramid