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Cancer in Alberta:
A Regional Picture 2007

Alberta
CANCER BOARD

cancer free **future**

Cancer in Alberta: A Regional Picture

The Division of Population Health and Information of the Alberta Cancer Board presents *Cancer in Alberta: A Regional Picture 2007*. This annual report outlines cancer trends and regional rates in Alberta. It provides a synopsis of data from the Alberta Cancer Registry to provincial health professionals and planners in an effort to assist with planning and policy-setting.

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The Alberta Cancer Board and its role

Research indicates that more than 50% of all cancers could be prevented or detected early enough to be successfully treated.

Cancer Free Future
> Reduce incidence by 35%
> Reduce mortality by 50%
> Eradicate suffering from cancer

This report, *Cancer in Alberta: A Regional Picture,* is prepared annually by the Alberta Cancer Board for health professionals in Alberta's health regions. It can be used as a reference document providing current data on cancer, comparisons between regional health authorities, and trends and projections for cancer.

This year the Alberta Cancer Board has unveiled its vision for a Cancer Free Future. We strive toward this vision by focusing on the common purpose of achieving the following milestones for the year 2025:

> Prevent more than 61,000 cancers by reducing the projected cancer **incidence** by 35%.

> Save more than 45,000 lives by reducing **mortality** by 50% compared to the numbers predicted for 2025.

> Work to eradicate suffering in all its forms, so any day spent living with cancer can still be a day spent fully alive.

The Alberta Cancer Prevention Legacy Act, proclaimed in 2006, provides an opportunity to bring true innovation to the field of Cancer Prevention in order to benefit all Albertans in the future. This Act establishes a Cancer Prevention Legacy Fund Endowment of $500M to facilitate the achievement of the above mentioned milestones.

The Funds from this endowment will be used to advance research, prevention and screening strategies, as well as support innovative evidence-driven comprehensive strategies that include research, social marketing, education, public policy and community development. These strategies will be accomplished by partnering health promotion practitioners with research, surveillance and evaluation expertise.

The information presented in this report will help to illustrate the current burden of cancer in Alberta, highlighting the importance of the vision for a Cancer Free Future.

In Alberta, all cancer cases and deaths are captured in the Alberta Cancer Registry maintained by the Alberta Cancer Board and are used in **surveillance**[1] activities. Public Health surveillance is defined as "the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control." [2]

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1   In this document the terms defined in the glossary are bolded and green at their first occurrence in the text.

2   Centers for Disease Control. Comprehensive Plan for Epidemiologic Surveillance. Atlanta, GA: Centers for Disease Control, 1986.

Organized screening programs test otherwise healthy people to identify the presence of disease before symptoms occur.

Cancer Free Future:
> Tobacco control
> Increased vegetables and fruit in your diet
> Being physically active
> Having a healthy weight and
> Protection from excess sun exposure

The data in this report are part of this chain of knowledge. Mainly due to an aging and growing population, cancer incidence is continuing to increase in our province and, therefore, using this knowledge is particularly important in working towards a Cancer Free Future.

It is essential to emphasize that research indicates that more than half of all cancers could either be prevented or detected early enough to be successfully treated.[3] Prevention is one of the tools that can be used in a multi-faceted approach necessary to reach the Cancer Free Future milestones of a reduction of 35% in incidence and 50% in mortality. Prevention measures include tobacco control, increased vegetable and fruit consumption, increased physical activity, maintaining healthy body weight and sun safety measures. Organized screening programs are the best approach to early detection as the cancer is more likely to be found at a stage when there is the greatest opportunity for successful treatment. In addition, treatment (including surgery, radiation and chemotherapy), along with supportive care, is also critical in controlling the burden of cancer. Supportive care is the third milestone of a Cancer Free Future: working to eradicate suffering of cancer patients and their loved ones. Ongoing research will help to ascertain the more effective cancer control programs for prevention, screening and treatment.

In summary, the Alberta Cancer Board is working to create environments that support healthly decision making and ensure that Albertans receive the information and services they need to minimize their risks of developing cancer, increase their chances for early detection, enhance treatment and improve their quality and quantity of life. The Alberta Cancer Board's Division of Population Health & Information produces this report which can be used as a tool in the battle towards a Cancer Free Future in Alberta.
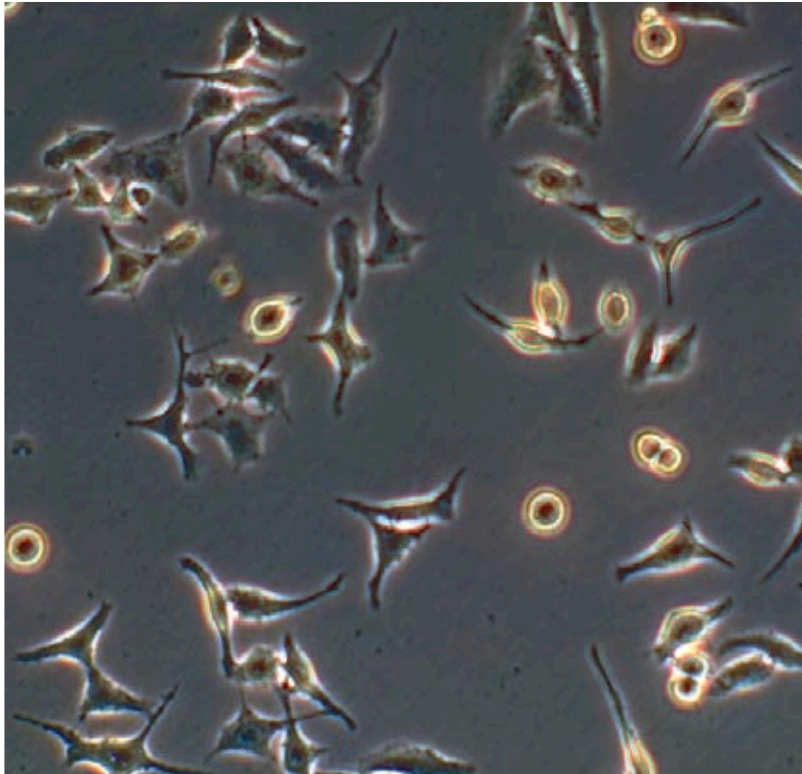
What is cancer?

Cancer is not a single disease – it is a related group of more than 200 different diseases.

For cancer to be classified as a group of diseases there must be some commonality between them.[4] What these diseases do have in common is that they have abnormal cells within the body that are dividing and spreading without control, whereas normal cells grow and divide but produce only enough cells required to keep the body healthy. The abnormal growth rate of the cancer cells often results in a tumour.

Where it is found in the body

> Cancer can begin at almost any site in the body and it behaves differently depending on its point of origin.

> Cancers are most often named for the part of the body in which they originate: for example, cervical cancer begins in the cervix, and colorectal cancer starts in the colon or rectum.

> **Tumours** are also classified by the type of tissue they affect:

  o **Carcinoma**, the most common type of tumour, refers to tumours that occur in the cells that line the organs and cover the surface of the body.

  o Leukemia and lymphoma refer to tumours occurring in the blood (leukemia) and immune (lymphoma) systems.

  o Sarcoma refers to tumours that occur in fibrous tissue, muscle, or bone.
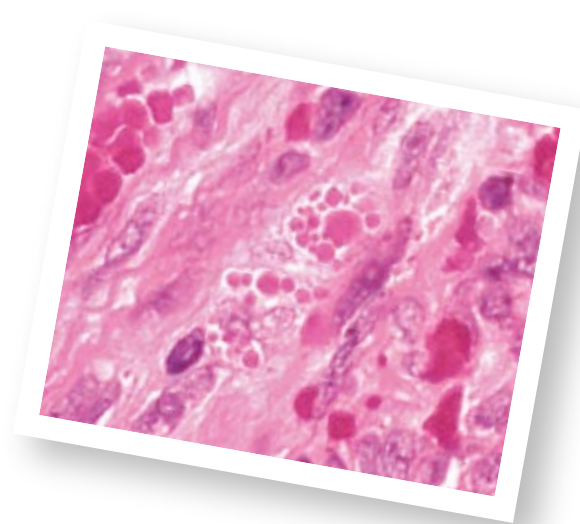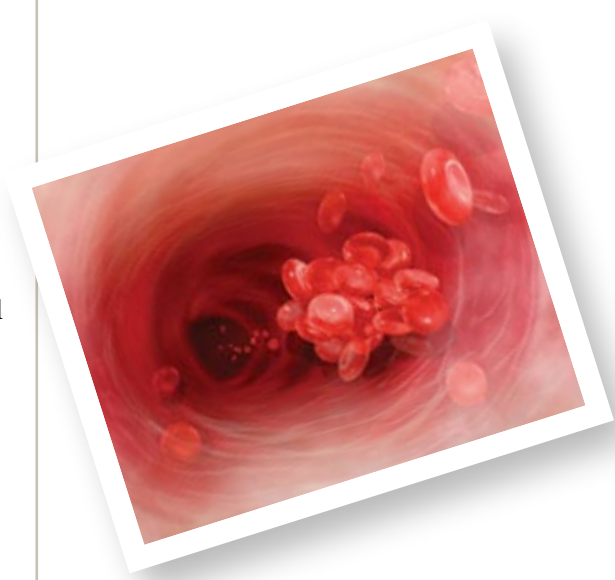
Malignant versus benign

When left untreated, **malignant** cancer cells can invade nearby tissue and spread through the bloodstream and **lymphatic system** to other parts of the body; this is termed **metastasis**. It is this ability of malignant tumours to invade and spread to other tissues in the body that makes cancer so deadly. In general, a tumour that is slow growing and does not spread is considered **benign**. Such tumours are generally harmless unless they affect the function of surrounding tissue.

So, to summarize, cancer is a group of diseases which can occur at almost any site in the body and can, in fact, spread. Cancer adversely affects the lives of many Canadians and in the following sections a more detailed picture will be presented of how it impacts Albertans in particular.

*The burden of cancer:
Potential years of life lost*

Cancer presents the largest burden of disease to Canadians as a leading cause of premature death.

One of the frequently used measurements of premature deaths is the potential years of life lost (PYLL).

In the analysis below, PYLL was calculated by subtracting the age at which a person dies from the life expectancy in the **life table.** PYLL gives a good indication of the impact of cancer on the population.

In Canada, cancer outranks all other major diseases as the number one cause of **potential years of life lost (PYLL)** for men and women. In 2003, 1,006,000 potential years were lost as a result of cancer, representing 32% of the PYLL resulting from all causes of death.[5]

Figure 1: Potential Years of Life Lost (Total) Due to Cancer, Alberta, 2004
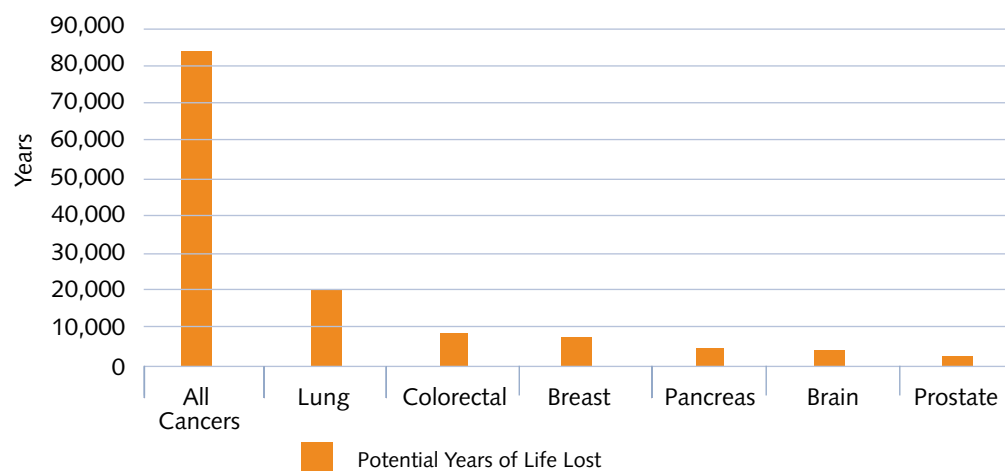
Figure 1 is ranked in order of total PYLL for both sexes combined and the numbers are calculated based on life expectancy. It can be seen from this figure that cancer has a huge impact on Albertans: 84,054 potential years were lost as a result of cancer. Cancer is the leading cause of premature death in Alberta. Premature death occurs more frequently in the cancers that are more common, have an earlier age of onset and a more rapid progression to mortality.

5   Canadian Cancer Society/National Cancer Institute of Cancer: Canadian Cancer Statistics 2007; www.cancer.ca

Figure 2: Potential Years of Life Lost (Males and Females) Due to Cancer, Alberta, 2004
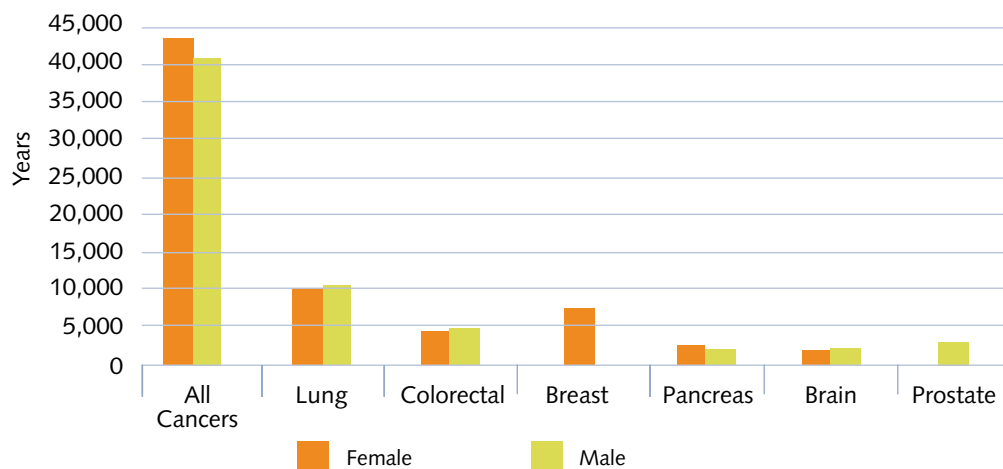
The PYLL due to specific types of cancer show that lung cancer was responsible for 20,316 PYLL (Figure 1), representing 24.2% of the premature mortality caused by cancer. For men in 2004 (Figure 2), the three leading cancers were lung, colorectal and prostate, accounting for 44.0% of the PYLL due to cancer. The three leading cancers for women (Figure 2) were lung, breast and colorectal, accounting for 50.3% of PYLL due to cancer. The ranking by relative importance of these cancers for men and women through PYLL has been consistent in recent years. For women, however, the potential years of life lost due to lung cancer, which are greater than for breast cancer, reflects the high **rates** of lung cancer mortality among women aged 50 to 79. Among men, although prostate cancer is more common than lung cancer, the PYLL due to lung cancer are 3.7 times higher than for prostate cancer, reflecting higher mortality rates for lung cancer and the younger age at which men develop and die from this disease.

With regard to the most common cancers in women and men, the PYLL from breast cancer (7,481) far exceeds the PYLL from prostate cancer (2,810). This reflects the older age at which prostate cancer occurs. Although the number of men who die from cancer each year exceeds the number of women, the PYLL for women (43,469) are higher than the PYLL for men (40,586). This is because women generally live longer than men, and some of the deaths due to female cancers occur at younger ages.

The overall Picture
of cancer in Alberta

In this section, information is presented to give an overall picture of cancer in this province. As an introduction, the "highlights" section below puts our province in context compared with populations outside Alberta. The main highlights within Alberta and of specific cancer sites are also presented below.

Highlights

Comparisons to outside the province:

> When Alberta's overall cancer rate is contrasted with various populations worldwide[6], Alberta's rate falls in the middle – similar to Canada's rate.

> Across Canada, incidence and mortality rates tend to be higher in the Eastern than the Western provinces – Alberta's rates are similar to those of the other Prairie provinces.

Within Alberta:

> In 2004, 12,650 Albertans were diagnosed with cancer and 5,272 people died from it.

> In 2008 it is projected that close to 14,900 Albertans will be diagnosed with cancer and over 6,100 will die from the disease.

> The most common cancers in Alberta in 2004 were prostate, breast, colorectal and lung. These four cancers accounted for 55% of new cancer cases and about half of cancer deaths.

> The number of new cancer cases in Alberta is expected to increase steadily to about 27,640 cases in 2030; this is mainly due to the increases in the age and size of Alberta's population.

> Approximately 1 in 2 Albertans will develop cancer in their lifetime and 1 in 4 will die of cancer.

> Among Albertans in the productive age group of 35–64, cancer is the leading cause of death. It causes 39% of all deaths for this age group which is more than cardiovascular disease, stroke, infectious diseases, and accidental injury *combined.*
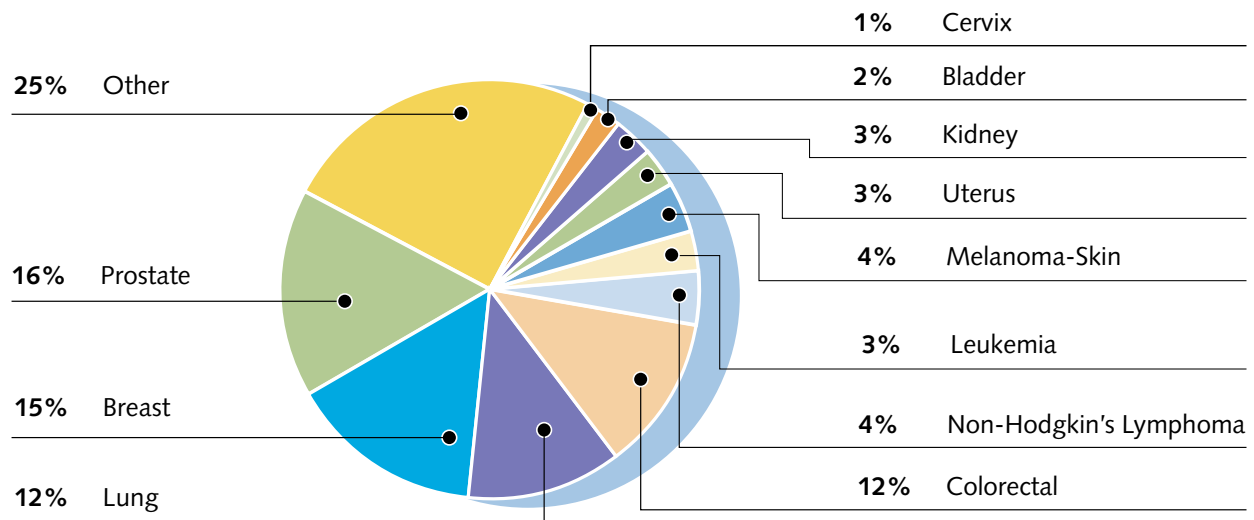
Specific sites:

> Lung cancer remains the most common cause of cancer death among both men (735 in 2004) and women (585 in 2004). Incidence and mortality rates for females have risen in the past 18 years. Male incidence and mortality rates have slowly declined over the same time period. For females, lung cancer has shown a 2.5% annual increase in incidence, and a 3.0% annual increase in mortality. For males, there has been a 1.2% annual decrease in incidence, and a 1.1% annual decrease in mortality from lung cancer. The decreasing occurrence of smoking among the population is considered to be one of the main factors that contributes to declining lung cancer rates. Just 10 years ago, smoking frequency for males in the province was 33%. In the first half of 2005, the rate was 22%. Smoking rates for Alberta women are also declining and we expect lung cancer incidence rates will decrease in the next 10 years as a result.

> Colorectal cancer is the second-leading cause of cancer deaths in Alberta (651 in 2004).

> Prostate cancer is the most commonly diagnosed cancer of men. It accounts for 31% of cancer incidence among men: mortality rates for prostate cancer are slowly declining.

> Breast cancer is the most commonly diagnosed cancer of women. It accounts for 30% of cancer incidence in women: mortality rates have been declining even though the incidence is increasing. There has been a 0.8% annual increase in incidence and a 2.1% annual decrease in mortality for females in the past 18 years. Cumulatively, the mortality has been reduced by 30.6% over the past 18 years for female breast cancer.
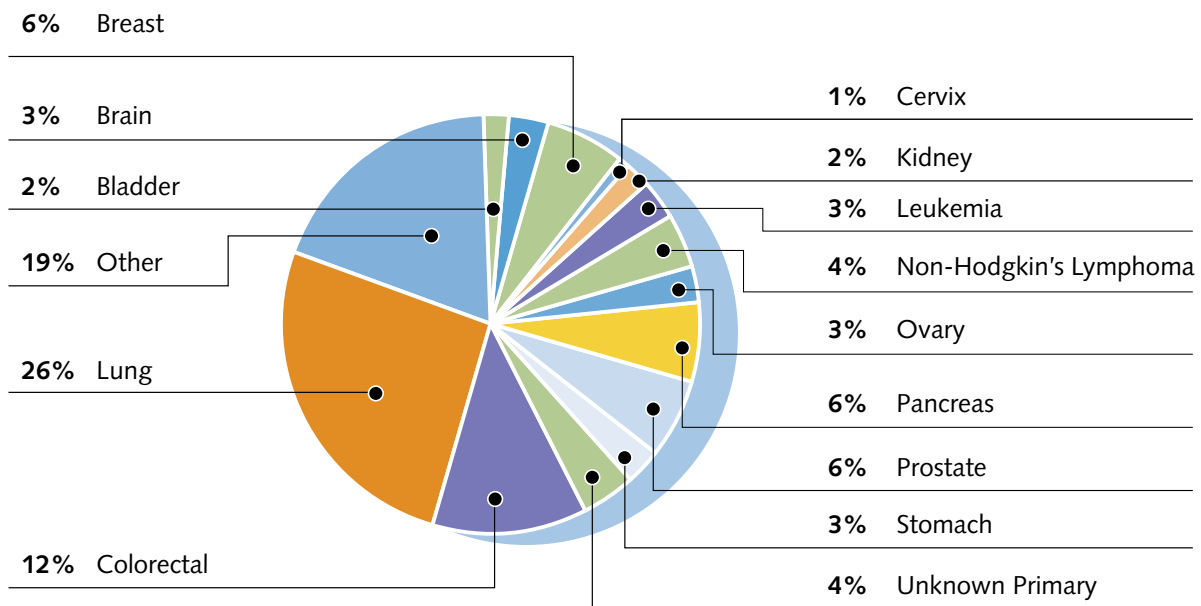
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6   Regions included areas of: USA, Czech Republic, Denmark, China, UK, Singapore, Poland, Australia, Japan, Colombia, Zimbabwe and India.

Cancer in Alberta

Figure 3[7] shows that prostate, breast, lung and colorectal cancers[8] were the most common cancers in 2004 in Alberta with a combined total of 55% of all cancers. These four cancers are shown in Figure 4 to be responsible for half of cancer deaths. A large number of less-common cancers make up the remaining number of new cancer cases and deaths.

Figure 3: New Invasive Cancers by Site, Alberta, 2004

25% Other	**1%** Cervix
	2% Bladder
	3% Kidney
16% Prostate	**3%** Uterus
	4% Melanoma-Skin
15% Breast	**3%** Leukemia
	4% Non-Hodgkin's Lymphoma
12% Lung	**12%** Colorectal

Figure 4: Cancer Deaths by Site, Alberta, 2004

6% Breast	**1%** Cervix
3% Brain	**2%** Kidney
2% Bladder	**3%** Leukemia
19% Other	**4%** Non-Hodgkin's Lymphoma
	3% Ovary
26% Lung	**6%** Pancreas
	6% Prostate
12% Colorectal	**3%** Stomach
	4% Unknown Primary

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7   Incidence and mortality rates for non-melanoma skin cancer (NMSC) are not included in any of the statistics presented in this document. Although approximately 30% of the malignant cancers diagnosed among Albertans each year are NMSC, these tumours are generally not life-threatening and, therefore, rarely included in cancer registry reports.

8   In this document, the term "cancer" is used to indicate **invasive cancers** unless otherwise specified.

Some cancers are not very common but, due to their poor prognosis, they make a relatively large contribution to mortality. As illustrated in Figure 4, these include stomach, brain and pancreatic cancers. These three cancers were responsible for 12% of the deaths in 2004 despite the fact that each of them accounted for fewer than 2% of newly diagnosed cases. Their low incidence meant that they were not individually identified in Figure 3. Lung cancer also has a poorer prognosis than other cancers: it accounts for 12% of new cases but 26% of cancer deaths.

Figure 5: All Causes of Death in Alberta, All Ages, 2004

28% Other	**4%** Injury
	4% Infection
28% Heart Disease	**7%** Stroke
	29% Cancer
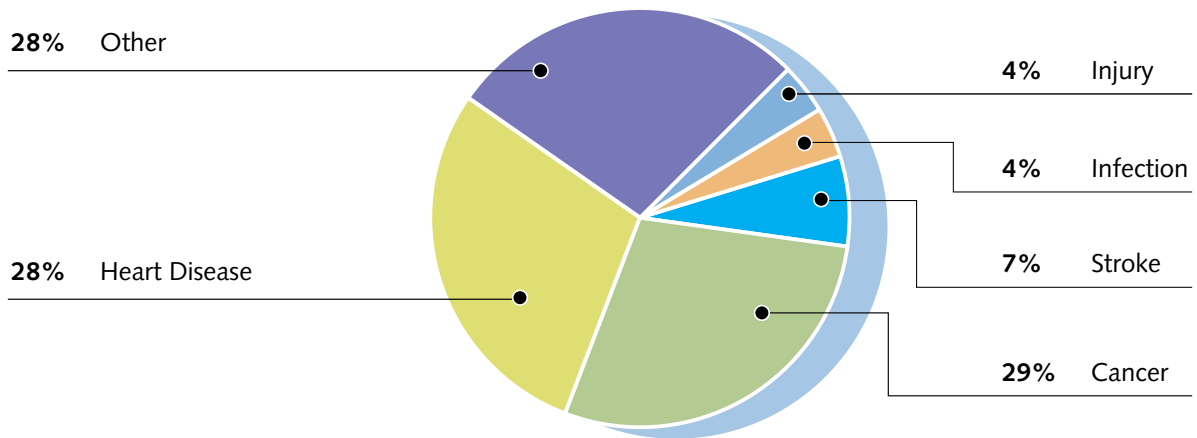
Cancer is a major issue for Albertans. According to the most recent statistics available from the Government of Alberta (see Figure 5), 29% of deaths in Alberta for all ages in 2004 were attributable to cancer, 28% were caused by heart disease and 7% by stroke. All other causes combined accounted for the remaining 36% of all deaths. "All other causes" included injury, infection and others. Cancer is the leading cause of death in Alberta.

Figure 6: **All Causes of Death in Alberta, Ages 35–64, 2004**

39% Cancer	**3%** Infection
	2% Stroke
	7% Injury
30% Other	**19%** Heart Disease
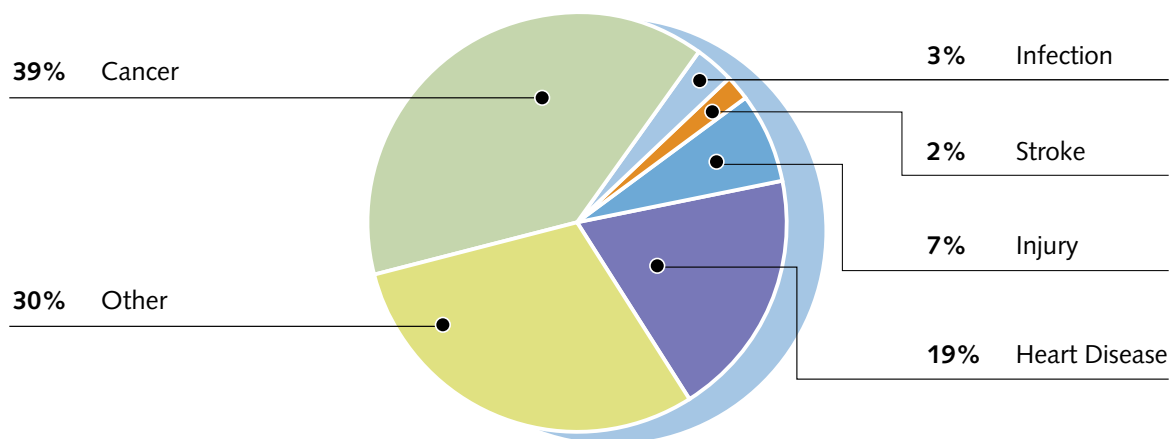
It is important to note the fact that, among the age group of 35–64 (Figure 6), cancer is the *leading* cause of death. It accounts for 39% of all deaths for this age group. This is more than cardiovascular disease, stroke, infectious diseases, and accidental injury *combined*. This age group contributes extensively in terms of productivity in society and, therefore, the impact of cancer on this group considerably affects the wider community as well as the individuals and their families.

For Albertans in the most productive age group of 35–64, cancer is the leading cause of death accounting for more deaths than the other major causes put together.

Understanding the
Cancer Picture

The Alberta Cancer Board is dedicated to controlling cancer, thus lessening its burden on individuals and society. It has set the goals for a Cancer Free Future and will achieve them through prevention, screening, treatment and research.

Information about how many people have cancer and how many die from it is vital when we are looking at the immensity of the challenge of cancer in Alberta. In this section we will focus on describing this challenge.

Understanding incidence and mortality is the first part of the cancer picture; this includes assessing the average annual per cent change in order to identify trends and projections of future incidence. These trends and projections are partly dependent on the aging of the population.

The next step is to include information on the likelihood of developing and dying of cancer, cancer survival, and the number of people currently living with cancer **(prevalence)**. A summary report of new cancer cases and deaths for 2004, broken down by sex, age group, and cancer site is included in the appendix.

Through this section we will gain a clearer picture of what we are currently dealing with and how far we have to go to reach the 2025 milestones.

The key messages of the following sections are:

> **Incidence and mortality:** cancer incidence rates were slowly increasing, but there has been a decrease over the last three years; also trends vary according to site. Mortality rates have remained fairly stable.

> **Cancer trends and projections:** cancer cases are rapidly increasing due to an aging and growing population.

> **The risk of developing and dying of cancer:** one in two Albertans will develop cancer and one in four will die of cancer.

> **Cancer survival:** survival has improved for many of those diagnosed with cancer in the past several years. This is not true for all cancer sites, however.

> **Prevalence:** the number of people living with cancer continues to grow each year.

Incidence and mortality

Definitions:

> Cancer incidence is the frequency of new cancer cases during a period of time and is, therefore, a good way to assess the impact of a disease.

> Cancer mortality is the number of deaths due to cancer during a period of time.

> In order to enable comparisons over time or between populations, **age-standardized incidence rates** or **age-standardized mortality rates** are used. These are weighted averages of age-specific rates using a standard population distribution.

Incidence and mortality can both be affected by prevention, screening and research. It should be noted that there is always a lag time between the beginning of a prevention intervention and a change in incidence or mortality. If cancer is detected early, for example through a screening program, then mortality is likely to be reduced as treatment is generally more successful at the early stages. Cancer treatments also continue to improve chances of survival.

Figure 7: **Age-Standardized Incidence Rates (ASIR) and Age-Standardized Mortality Rates (ASMR), Alberta (1987–2004)**
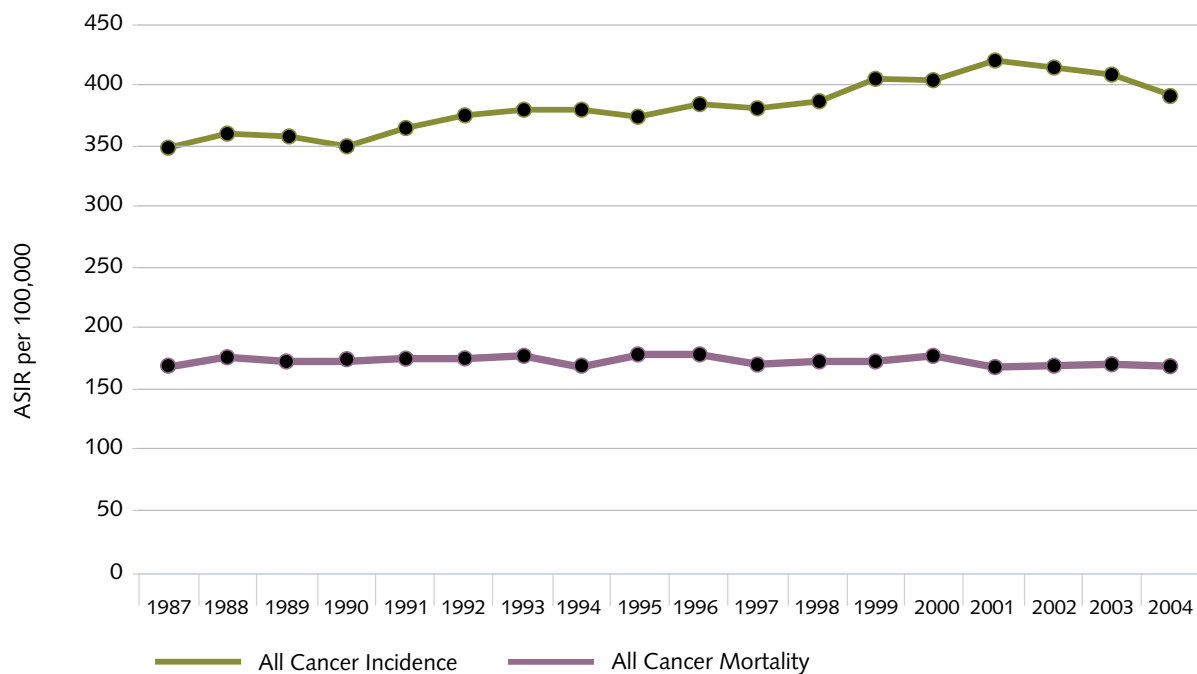
In Figure 7 we can see that overall age-standardized cancer incidence rates are slowly increasing and age-standardized death rates are relatively stable.[9] From 1987–2004, there has been a 1.1% annual increase in incidence rates. However, in recent years, 2001–2004, ASIR started to decrease and has decreased by 1.7% annually over these four years.

9   Population data is from Alberta Health and Wellness. Standard population used in calculation of age standardized rates: 1991 Canadian standard population.

Table 1: New Cases and Number of Deaths for Invasive Cancer by Site, Alberta, 2004

Site	New Cases	Number of Deaths
Male Lung	825	735
Female Lung	723	585
Female Breast	1,869	340
Prostate	1,986	314
Female Colorectal	659	289
Male Colorectal	856	362

Table 1 summarizes the four most common cancers for 2004.[10] The main points to take from this table are:

> lung and breast cancer are most commonly diagnosed in females;

> colorectal and prostate cancer are most commonly diagnosed in males;

> lung and colorectal cancer are the most common causes of death for males and females combined.

Figure 8: Age-Standardized Incidence Rates (ASIR) by Site, Alberta (1987–2004)
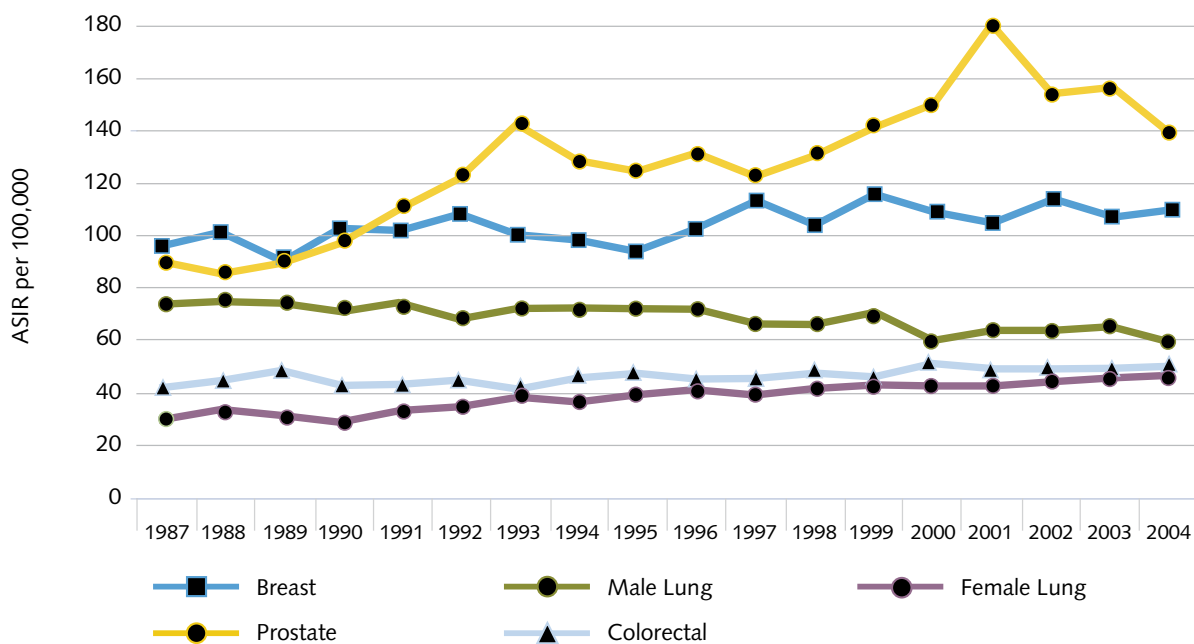
10   See appendix for more detailed information.

Figure 8 shows the picture of age-standardized incidence rates over time for the four most common cancers. The rates for colorectal cancer for males and females have been combined and those for lung cancer are shown separately as trends differ by sex for this cancer. Prostate cancer rates in males and breast cancer rates in females are also included in the graph. As can be seen:

> lung cancer rates for females continue to increase at 2.5% average annually; [11]

> lung cancer rates for males are gradually decreasing at 1.2% average annually;

> from 1987–2004 there has been a 0.8% annual increase in incidence for female breast cancer;

> prostate cancer rates have fluctuated over the years. From 1987–1993, there was a dramatic increase in incidence rates with an 8.5% average annual increase. From 1993–1998, the incidence rates were fairly steady with a 0.9% decrease annually. From 1998–2001, the incidence rates increased sharply again with an 11.5% increase every year on average. From 2001–2004, there has been a 7.0% annual decrease in incidence rates.

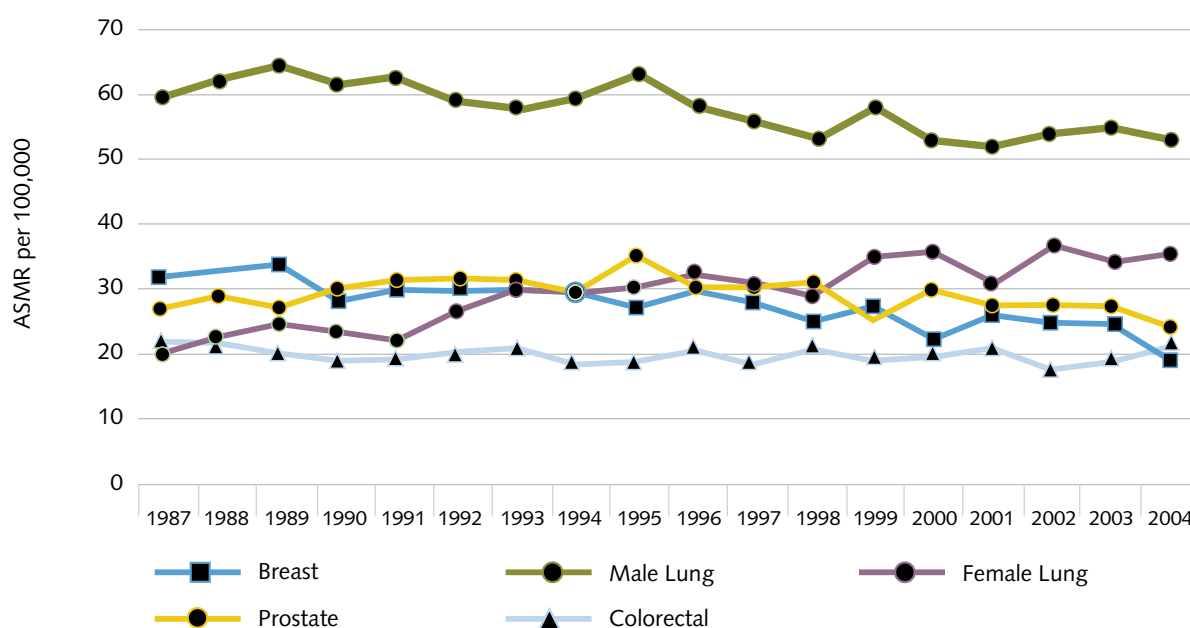**Figure 9: Age-Standardized Mortality Rates (ASMR) by Site, Alberta (1987–2004)**

Figure 9 presents mortality rates for colorectal cancer for males and females combined; the lung cancer mortality rates separately for males and females as trends differ by sex. It also includes the prostate cancer rates in males and breast cancer rates in females. It is important to note the following:

> Lung cancer is the leading cause of cancer deaths for both men and women; male rates have gradually decreased while female rates have steadily increased from 1987 to 2004. There has been a 3.0% annual increase in mortality for females and a 1.1% annual decrease in mortality for males.

> Colorectal cancer is the second-leading cause of death for men and women combined but the rates have stayed stable. There has been only a 0.2% annual decrease in mortality for males and a 0.1% annual decrease for females over the past 18 years.

11 The Average Annual Percentage Change (AAPC) of cancer has been computed using JoinPoint, which is software freely available from the United States' National Cancer Institute. JoinPoint provides the analysis of trends using joinpoint model based on the cancer incidence and mortality rates. The incidence rates are for the first invasive cancer, excluding non-melanoma skin cancers.

Further details on the methods and algorithms used in JoinPoint can be found at http://srab.cancer.gov/joinpoint/.

> There has continued to be a decrease in breast cancer mortality probably due to screening and treatment efforts. There has been a 2.1% annual decrease from 1987–2004.

> Prostate cancer mortality has decreased slightly overall. From 1987–1995 there was a 2.1% annual increase in the mortality rate for prostate cancer. However, from 1995–2004 the mortality rate decreased by 2.7% each year.

Cancer trends and projections

The next part of the cancer picture is to look at cancer trends and what they may be attributed to. Figure 10 shows the impact on trends of new cancer cases due to (1) changes in the rate of cancer, (2) population growth and (3) aging.

Figure 10: Trends in New Cases Attributed to Cancer Rate, Population Growth, and Aging Population[12]
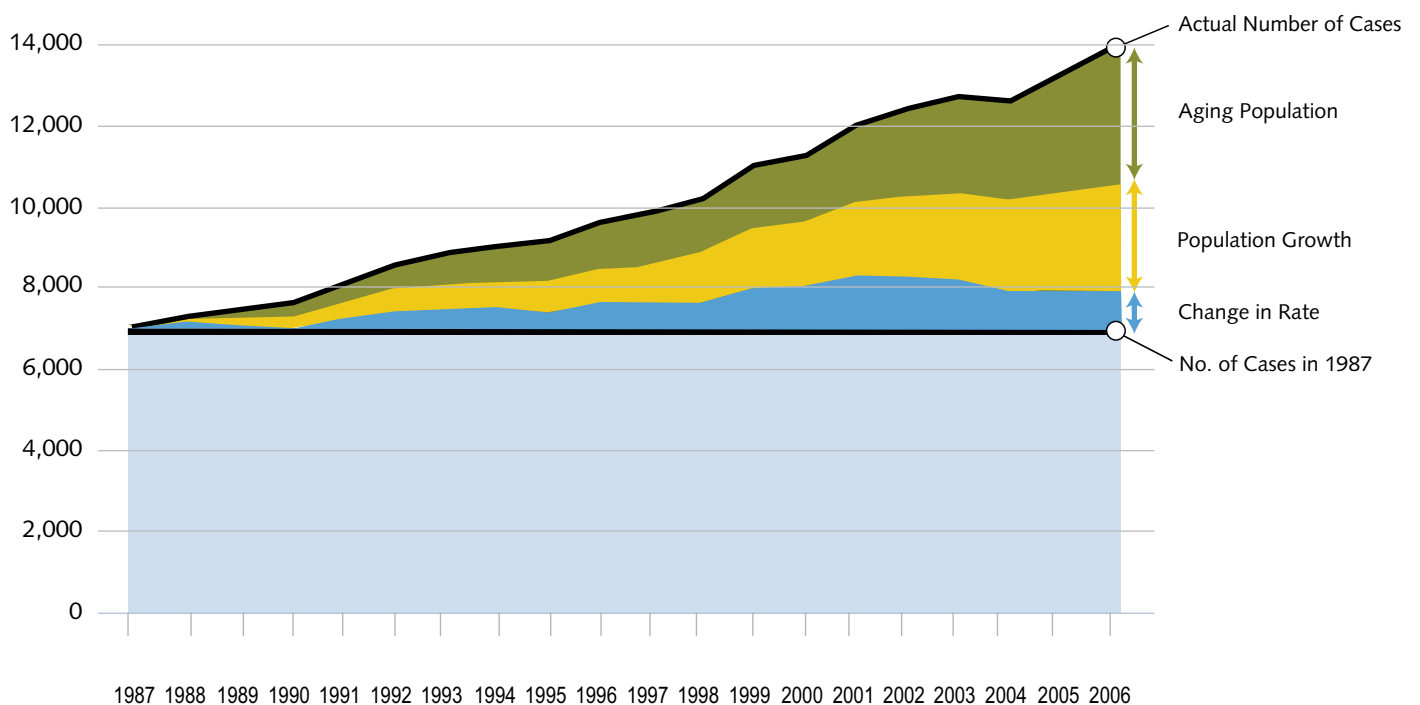
In Figure 10 the bottom black line represents the number of cases that occurred in 1987.

The upper black line represents the number of new cases that actually occurred. Between these two lines, the three areas reflect the increase of cases due to the impact of rate change, population growth, and aging population.

The dark blue shaded area (lower) represents the total number of new cases that would have occurred each year if the cancer incidence rates alone had changed but the population had remained the same as in 1987.

The yellow shaded area (middle) represents the number of new cases that would have occurred each year if the population alone had grown larger but the population age distribution had remained the same as in 1987.

The green shaded area (top) represents the number of new cases due to the aging population.

12   For 2005 and 2006, the number of new cases due to cancer rate, population growth and aging population are estimated because of the lag time in cleaning and coding cancer registry data.

The main message from this figure is that cancer cases are increasing in Alberta mainly due to population growth and an aging population. However, it must be remembered that although the aging population is an important part of the cancer picture, it is not the only factor. Cancer is a major cause of premature death as well; in the age group 35–64, cancer is the leading cause of death.

As well as looking at trends, the Alberta Cancer Board also develops cancer projections; this is partly so that the needs for future cancer care services can be predicted. The projected number of new cancer cases in Alberta for 2005–2030 is shown in Figure 11. The numbers for actual cases in this figure are slightly different in the 2006 report. This is due to factors, such as completed coding and data cleaning.

If current trends continue, the number of cancer cases is expected to double by 2030 to more than 27,000 cases annually. This projected increase is primarily a result of two factors: population growth and an aging population (as described below).

> *Population size* – Our population is continually growing and is projected to increase more than 30% by 2025. Even if the risk of developing cancer does not change, the increase in population means there will be more cancer cases in the province. As the projected number of new cancer cases partly depends on the size of the population, if Statistics Canada reduces the projected population numbers, the projected number of cancers will also fall. When one compares the incidence projections for 2010 up to 2030 with last year's report, the projected numbers in this report are lower. This is due in large part to a drop in the estimated population size.

> *Aging population* – Alberta's large generation of 'baby boomers' is entering an age where cancer becomes a health concern. An aging population will have a direct impact on the number of cancer cases in this province.

Figure 11: Actual and Projected Number of New Cases of Invasive Cancer, Alberta, 1990–2030
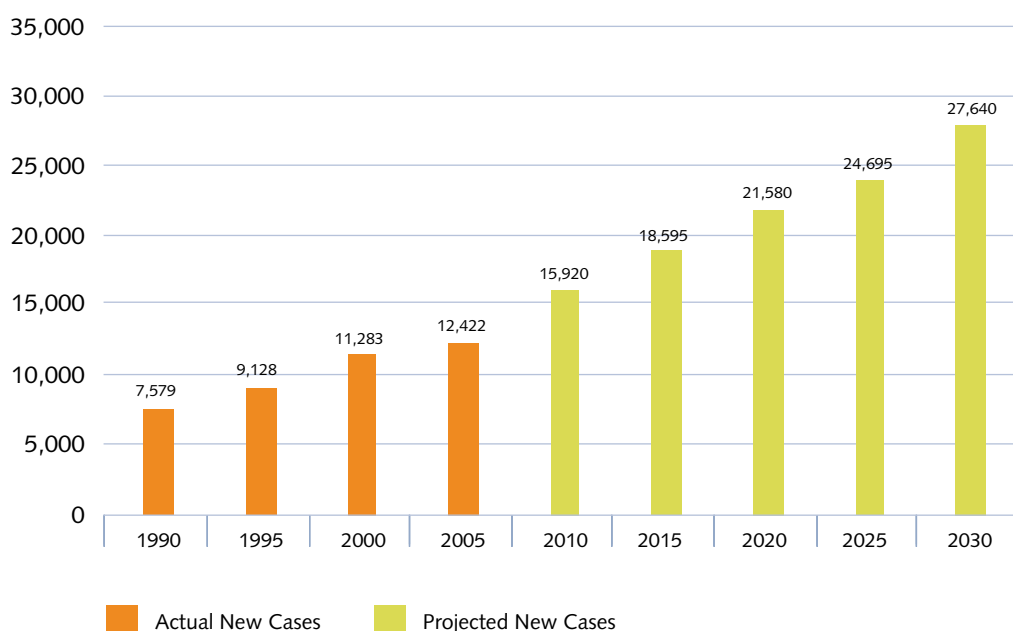
The risk of developing and dying of cancer

The risk of developing and dying of cancer[13] is another way of thinking about incidence and mortality over a lifetime as opposed to annually. The **probability of developing cancer** measures the risk of an individual developing cancer in a given age range, and is conditional on the person being cancer-free before the start of that age range. The probabilities shown below of developing and dying of cancer are averages over the entire Alberta population and should not be applied to a particular individual.

Table 2: Lifetime Probability of Developing or Dying of Cancer

	Lifetime Probability of Developing Cancer		Lifetime Probability of Dying of Cancer	
	Males 1 in	Females 1 in	Males 1 in	Females 1 in
Any Cancer	2.2	2.5	3.7	4.4
Female Breast	–	8.2	–	37.0
Prostate	5.9	–	25.3	–
Lung	14.2	16.5	14.7	19.0
Colorectal	13.6	17.4	27.3	34.0

Table 2 shows that approximately 1 in 2 Albertans will develop cancer in their lifetime and 1 in 4 will die of cancer. The probability of developing cancer varies with an individual's age and gender, and someone diagnosed with cancer has a higher probability of developing another cancer in the future.

As indicated in the table, the cancer site is a factor in the probability of developing or dying of cancer. For example, a female born today in Alberta has a 1 in 8 chance of developing, and a 1 in 37 chance of dying of breast cancer. Compared to breast cancer, the chances that a female born today will develop lung cancer are lower (1 in 16.5). However, the chances of dying from lung cancer are greater than for breast (1 in 19).

13 The probabilities of developing and dying of cancer have been computed using DevCan, which is software freely available from the United States' National Cancer Institute. DevCan computes age-conditional probabilities based on the cross-sectional incidence and mortality rates. The incidence rates are for the first invasive cancer, excluding non-melanoma skin cancers.

This methodology accounts for competing risks and assumes that these rates remain the same in the future. The Alberta data presented is based on incidence and mortality rates in 2004.

Further details on the methods and algorithms used in DevCan can be found at http://srab.cancer.gov/devcan/.

Figures 12a and 12b below show two main points with respect to age:

> the short-term (10-year) risk of developing cancer continues to increase with age;

> the risk of developing cancer over the individual's remaining lifetime decreases with an increase in age because older people often die of other causes.

To give an idea of what this means in reality, at age 50, a woman has a 38% (or 1 in 2.6) risk of developing cancer during the rest of her life and a 6% (or 1 in 16.7) chance of developing cancer in the next 10 years of her life (by age 60) as shown in Figure 12a. By age 70, the risk of developing cancer during the rest of her life has decreased to 28% (or 1 in 3.6) whereas the short-term risk has increased to 14% (or 1 in 7.1).

Figure 12a: Risk of Developing Cancer Within Next 10 Years and Within Remaining Years of Life, Females, 2004
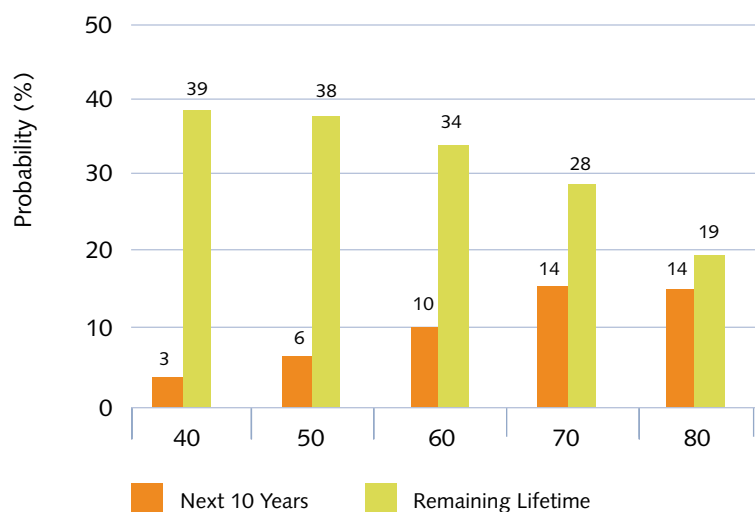
Figure 12b: Risk of Developing Cancer Within Next 10 Years and Within Remaining Years of Life, Males, 2004
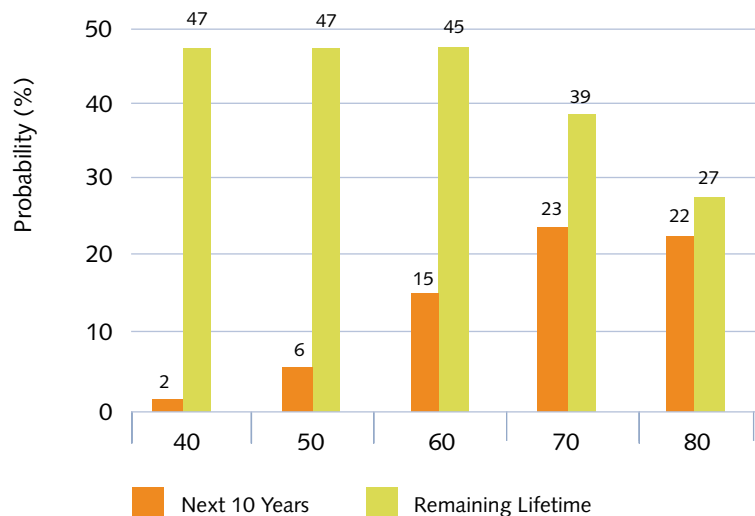
Cancer survival

Cancer survival is of particular interest for two groups:

> To cancer patients as the rates give an indication of the proportion of people who will be alive at a given point after diagnosis; and,

> To health professionals as it may allow some measure of the effectiveness of cancer control in the province.

Survival depends on several factors including:

> cancer site;

> **stage of the cancer** at diagnosis;

> type of cells affected;

> age at diagnosis;

> gender;

> presence of other negative health conditions; and,

> treatment.

Relative survival compares the survival of cancer patients with the survival of the general population with the same age and sex characteristics.

Figure 13: **Relative Survival[14] Trends in Alberta for All Cancers[15]**
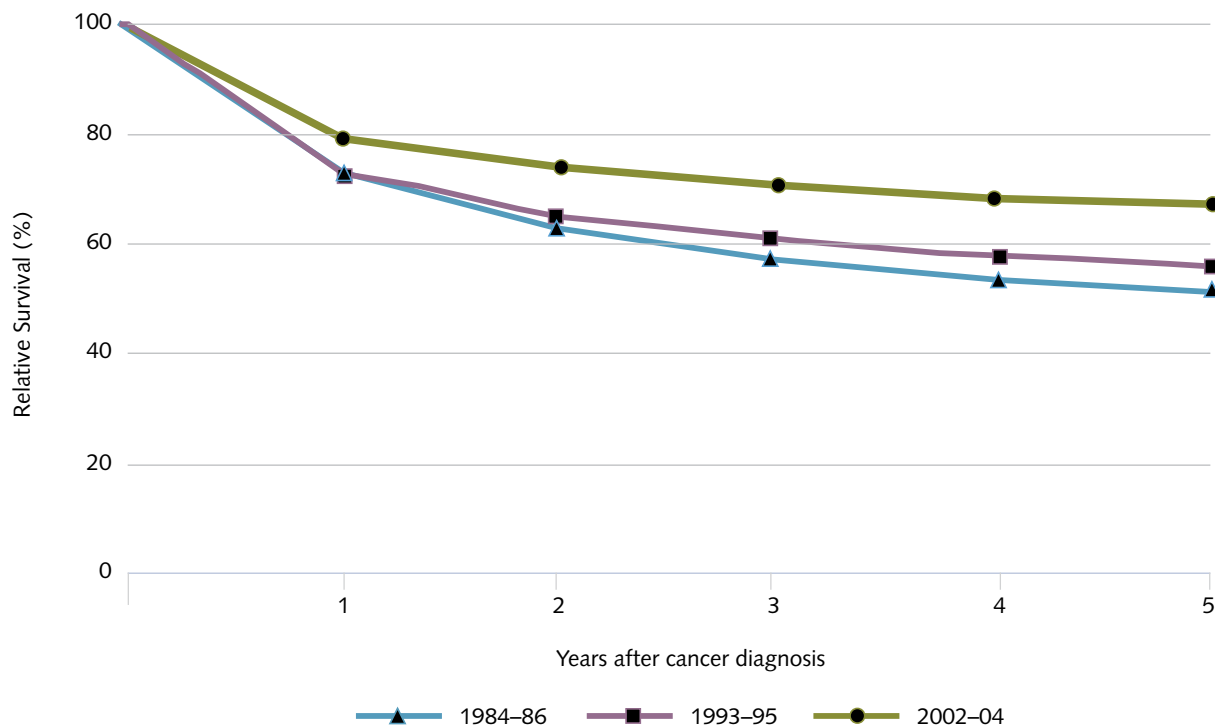
14   Further details on the methodology can be obtained from the paper: Brenner H, Gefeller O. "An alternative approach to monitoring cancer patient survival". Cancer 1996, 78, 2004-2010.

15   Please note: Figure 13 excludes non-melanoma skin cancers.

Figure 13 shows the five-year relative survival curves of Albertans diagnosed with cancer between 1984–86, 1993–95 and one for the prediction of survival for people diagnosed in 2002–04. Because five years of follow-up data is not yet available for people diagnosed in this later time period, the curves were predicted using **period analysis.**[16]

Looking at Figure 13 we see that the predicted survival curve for those diagnosed in 2002–2004 is above the other curves. This indicates that the prognosis for this group is expected to be better than for those diagnosed in the earlier years. The closer a curve is to the top (100%) the nearer the survival is to that of the general population. The hope is for the curves to continue to go higher because this would indicate that survival rates are improving.

As previously mentioned, survival rates vary dramatically among sites. For example, survival rates for prostate and breast cancer are much higher than those for colorectal cancer. In turn, survival rates for colorectal cancer are better than the survival rates for lung cancer. As a note, the improvement in breast cancer survival is a result of early detection and advanced treatment.

> Improved prognosis is expected for those diagnosed with cancer in 2002–2004 over those diagnosed in earlier years.

> On January 1, 2005, 93,200 Albertans were living with cancer. This number continues to grow each year.

Prevalence

The prevalence of a disease is the number of people currently living with that disease. The number of people living with cancer compounds annually and cancer prevalence is an important facet of the cancer burden picture.

As of January 1, 2005, 93,200 Albertans were living with cancer. Each year since then, 12,000 Albertans have been diagnosed with cancer and roughly 5,000 have died, leaving approximately an additional 7,000 people living with cancer each year.

The issue of cancer prevalence has two critical aspects:

>   The first is the good news story that, through early detection and improved treatments, more people are surviving these days (see previous section) and are in remission.

>   As a consequence, however, of the improved survival, the chances of recurrence and further treatment many years after the initial diagnosis are increased. This affects the individual, his or her family and the health care system. The number of recurrences combined with an increase in cancer incidence, leads to a higher total burden of cancer on individuals and society. This is the second critical aspect of prevalence.

This burden has several consequences which we will briefly outline here. These effects, however, are not yet fully understood:

1) the emotional trauma resulting from a cancer diagnosis may lead survivors to seek supportive care during the initial experience and even after their physical recovery;

2) the emotional toll on families and loved ones;

3) the economic factor including treatment costs and loss of work productivity.

It can be seen that the repercussions of an increase in prevalence will affect Alberta significantly. This makes it imperative that continued efforts are made in the control of cancer in this province.

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16   This methodology works backwards; for example, to estimate one-year survival probabilities, patients with a follow-up of one-year from diagnosis are used. For further explanation, see the glossary.

What is the picture for the Regional Health Authorities?

Aging population

As previously stated, age is an important part of the cancer picture in any population. However, it is not the only factor as shown by the 35–64 age group where cancer is the leading cause of death.

Table 3: **Alberta Population Distribution Over Time, Age Groups 35–64 and 65+**[17]

Regional Health Authority	1985			2005			2030		
	Population Total	% of Total 35-64	% of Total 65+	Population Total	% of Total 35-64	% of Total 65+	Population Total	% of Total 35-64	% of Total 65+
1	136,435	28.5	11.2	154,910	37.2	13.6	187,608	35.9	20.5
2	80,710	28.7	10.7	100,977	38.4	12.6	139,930	38.7	18.2
3	748,401	30.5	7.0	1,171,275	42.0	9.5	1,779,323	40.1	17.9
4	224,249	28.6	10.0	293,848	39.2	11.9	390,483	37.2	19.3
5	105,327	29.7	13.8	110,483	39.6	15.4	123,696	38.4	22.8
6	787,678	30.3	7.3	1,005,411	41.2	11.1	1,355,203	38.6	20.8
7	151,116	27.9	8.3	176,363	38.9	10.6	188,746	37.5	21.5
8	109,127	26.8	6.6	135,246	37.7	8.9	197,651	37.9	16.9
9	53,804	23.0	1.7	73,679	37.4	2.8	128,810	37.4	14.2
Total	2,396,847	29.6	8.0	3,222,191	40.6	10.6	4,491,450	38.8	19.1

Table 3 shows the Alberta population distribution, across regional health authorities (RHA), over time with emphasis on the age groups 35–64 and 65+. When we study the table we can see the following:

> Overall, the percentage for the 35–64 age group increased sharply between 1985 and 2005, but is expected to remain approximately the same in the future.

> On the other hand, the increase in the percentage of the population over age 65 has been quite gradual over the past 20 years, from 8.0% to 10.6%. In the future, a much steeper increase can be expected, from 10.6% in 2005 to 19.1% in 2030.

> The percentage aged 35–64 is similar across regions over time.

> However, the proportion aged 65+ shows significant variation across regional health authorities. As an example, in region 9, an estimated 2.8% of the population were over age 65 in 2005, compared to 8.9% in region 8. These figures indicate that, even if age-standardized cancer rates were identical in these regions, there would be a higher number of cancer cases expected in region 8. This is because residents in that area of the province are older and the population is larger.

Cancer numbers are expected to rise in Alberta as the population increases and ages.

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17   The numbers for 2030 are based on Alberta Health and Wellness population projections.

Cancer rates by region

Background information

Before the specific details of the cancer rates across regional health authorities are discussed, it is important to note the presentation format of the information in this report:

> The bar graphs show the incidence/mortality rate values for each region by site and their corresponding **confidence intervals.**

> The colour-coded maps illustrate how the observed rates in each region compare with the provincial average. They take into account the variability in region population sizes. In order to produce these maps, each regional cancer rate was compared to the provincial rate.[18]

> RHAs with a small population can have the lowest or highest *absolute* rates (as shown in the bar graphs), but it does not mean that their rates are lower or higher than the provincial level (as shown in the maps) if their variability is not taken into account.

What the following pages show us

In the subsequent pages, age-standardized incidence and mortality rates for all cancers, lung cancer, colorectal cancer, female breast cancer, and prostate cancer are presented for each of Alberta's nine health regions (Figures 14–23). These rates are three-year averages.[19]

Any observed differences in rates may be due to several factors, such as:

> regional differences in diagnostic activity or cancer screening; and/or,

> differences in prevention efforts or in risk factors such as smoking and obesity rates.

In the future we will have a better ability to investigate any differences between regions.

How to read the bar graphs and the maps

> **Bar graphs**
The bar graphs are those figures with the designate "a" after the number. On these graphs the "I" lines show 95% confidence intervals. These confidence intervals indicate how precise a rate estimate is: a wide confidence interval (a longer "I" line on the bar) indicates less precision and occurs when a population size is smaller.

  It should also be noted that the scales on the Y axis of the graph (which represent rates) differ greatly from figure to figure.

> **Maps**
The maps show how each region compares with the province. The green colour indicates that the region's rate is *lower* than the provincial average with blue being the *lowest* level. The orange and red colours show the *higher* rates with red being the *highest*. **Please note: the highest and lowest rates may still be within the range of "normal distribution," especially if the region has a smaller population.**

> **Comparing bar graphs and maps**
It is possible that, when looking at the bar graphs and maps together, they may appear to be indicating slightly different conclusions. However, they need to be examined in conjunction with population size (see "Background information" above). This means that, although some of the rates may appear higher or lower than the corresponding provincial rates, the statistical analysis shows that the rates in that specific health region are similar to the provincial rates.

In general, most health regions have rates very similar to the provincial average.

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18 The proportion of GIS graph is 1:4,940,400. The mapping method is to calculate the standard scores for rates of each RHA by sites and sex. If the standard score is greater than two, it represents that the rate of that particular RHA is in the highest level compared to provincial average rate. If the standard score is between one and two, it represents that the rate of that particular RHA is in the higher level compared to provincial average rate. The standard score is calculated from the difference between individual RHA and provincial average divided by RHA's standard error. The score measure is based on taking variability into account. Please refer to Erik Ellohoj's report * for further details.

   Erik Ellohoj, et al. "Health Rate Mapping Template-Geographic Methodology Series No. 3", Internel report for Alberta health and Wellness(Surveillance) 2004.

19 Three year averages are calculated by summing numbers (cases or deaths) for 2002, 2003, and 2004 and dividing by three. Three year averages were used because small numbers in some health regions can lead to large yearly fluctuations – averaging produces more reliable numbers.
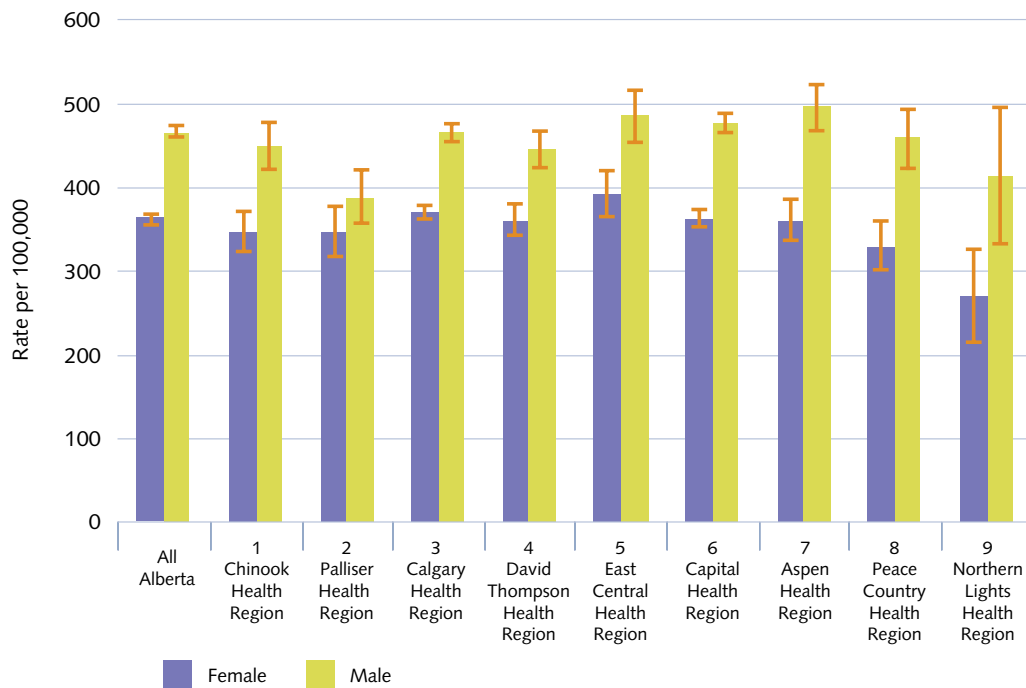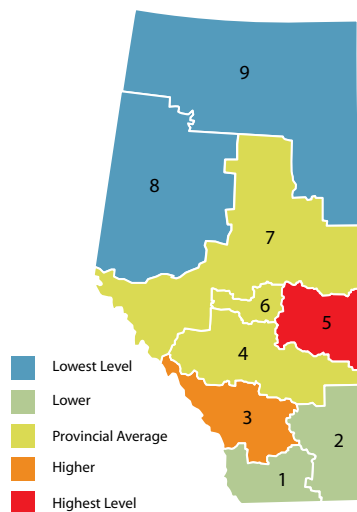
Rates for all cancers

In the following statements, the variability in rates is taken into account.

Age-standardized incidence rates for all cancers: compared to the province, incidence in females was lowest in Peace Country Health Region, and Northern Lights Health Region; incidence in males was lowest in Palliser and David Thompson Health Regions. East Central Health Region for females and Aspen Health Region for males had the highest rates compared with the province.
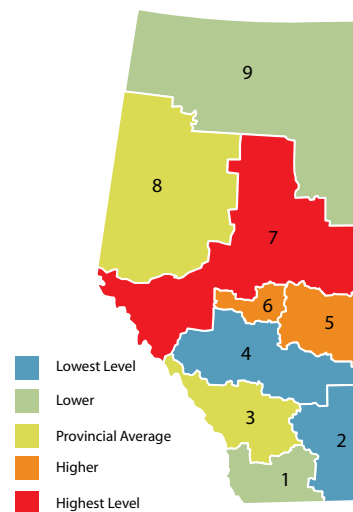
Figure 14a: **Age-Standardized Incidence Rates for All Cancers by Regional Health Authority, 2002–2004**

Figure 14b: **Female Age-Standardized Incidence Rates for All Cancers by Regional Health Authority—Comparison with Provincial Average, 2002–2004**
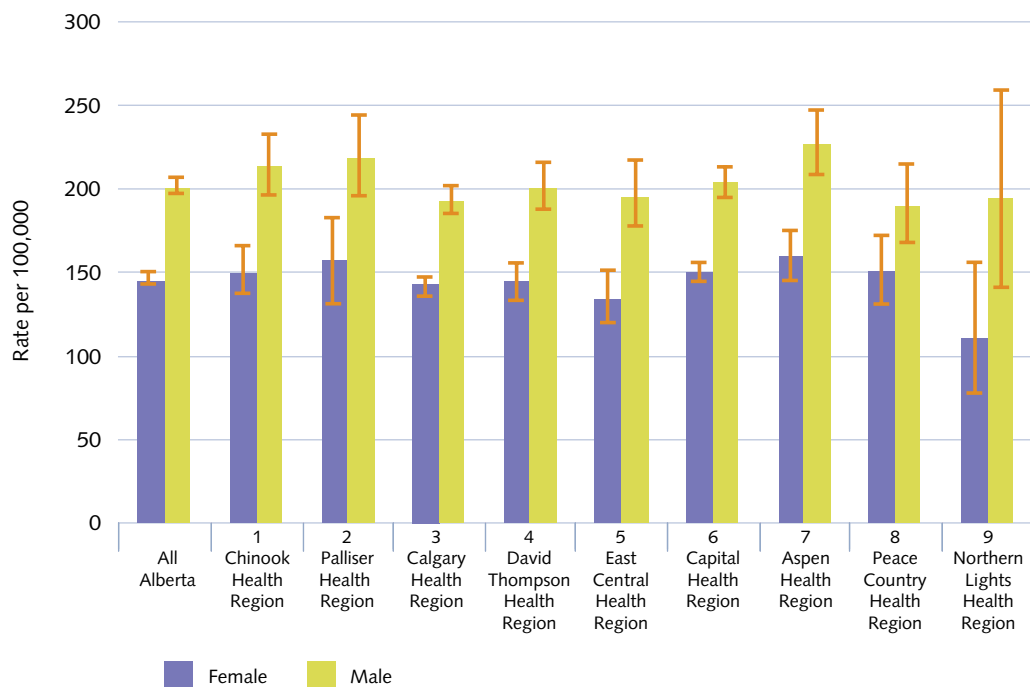

Figure 14c: **Male Age-Standardized Incidence Rates for All Cancers by Regional Health Authority—Comparison with Provincial Average, 2002–2004**

Age-standardized mortality rates for all cancers: for females the region with the lower rate was Northern Lights Health Region whereas for males it was Calgary Health Region, with the highest being Aspen Health Region.

Figure 15a: **Age-Standardized Mortality Rates for All Cancers by Regional Health Authority, 2002–2004**

Figure 15b: **Female Age-Standardized Mortality Rates for All Cancers by Regional Health Authority—Comparison with Provincial Average, 2002–2004**

Figure 15c: **Male Age-Standardized Mortality Rates for All Cancers by Regional Health Authority—Comparison with Provincial Average, 2002–2004**

Lung cancer rates

Age-standardized incidence rates for lung cancer: the difference in incidence rates in Capital Health Region was marginal compared to the provincial average for males. Because risk factors for lung cancer (i.e. tobacco use) are experienced decades before diagnosis, this may reflect risk factor patterns that are no longer extant. The rates in Capital Health Region will continue to be monitored.

Figure 16a: Age-Standardized Incidence Rates for Lung Cancer by Regional Health Authority, 2002–2004

Tobacco use is related to at least 85% of all new lung cancer cases.

Figure 16b: Female Age-Standardized Incidence Rates for Lung Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004
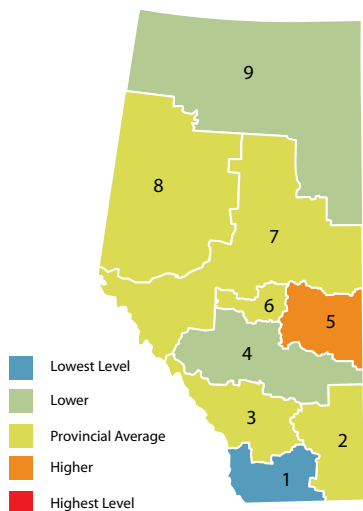
Figure 16c: Male Age-Standardized Incidence Rates for Lung Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004
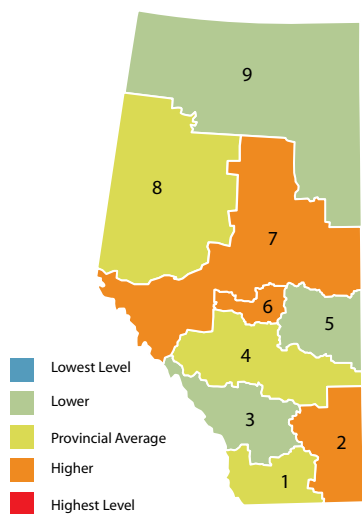
Age-standardized mortality rates for lung cancer: mortality rates were relatively lower for females in Chinook Health Region and males in Calgary Health Region. Males in Capital and Aspen Health Regions had the highest rates.
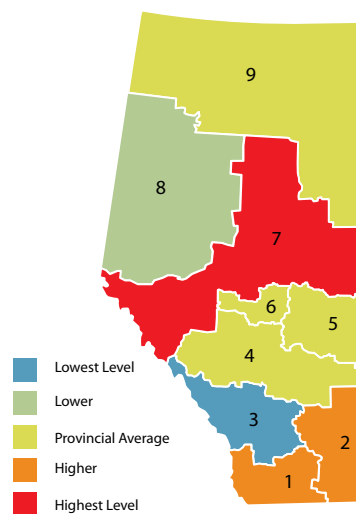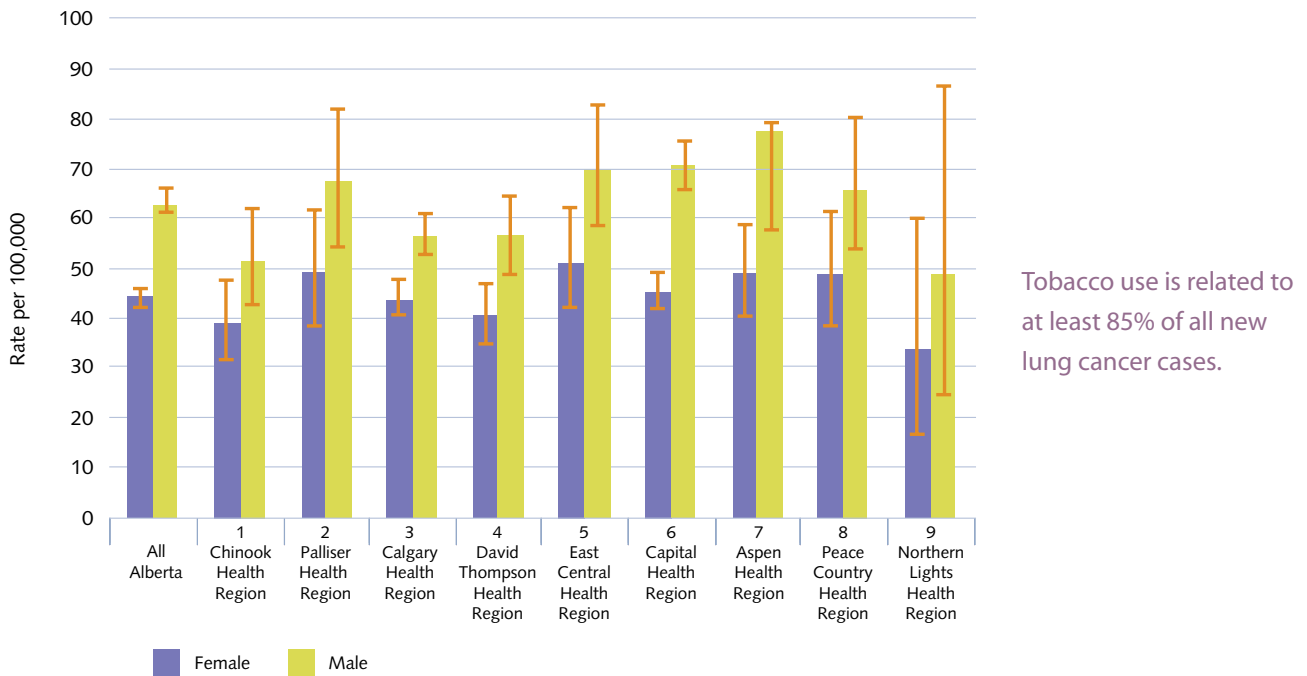
Figure 17a: Age-Standardized Mortality Rates for Lung Cancer by Regional Health Authority, 2002–2004

Figure 17b: Female Age-Standardized Mortality Rates for Lung Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004

Figure 17c: Male Age-Standardized Mortality Rates for Lung Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004

Colorectal cancer rates

Age-standardized incidence rates for colorectal cancer: most of these rates were the same as the provincial average except for Calgary Health Region females which had a low rate as well as Chinook and Palliser Health Regions males. East Central Health Region females had the highest rates.
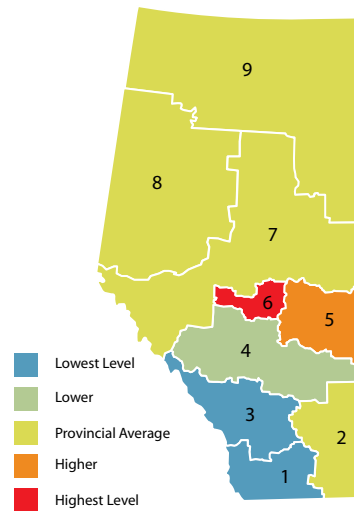
Figure 18a: Age-Standardized Incidence Rates for Colorectal Cancer by Regional Health Authority, 2002–2004

Figure 18b: Female Age-Standardized Incidence Rates for Colorectal Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004
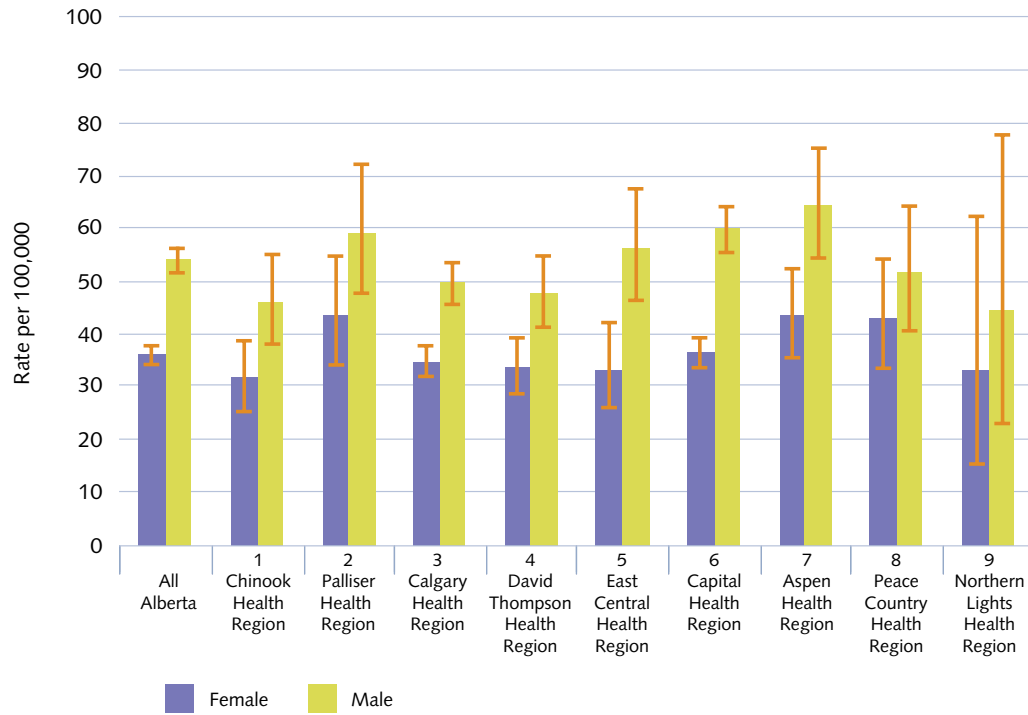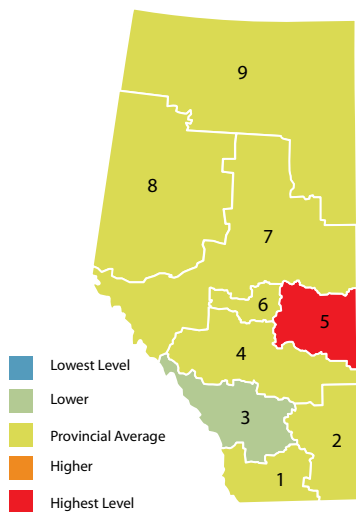

Figure 18c: Male Age-Standardized Incidence Rates for Colorectal Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004
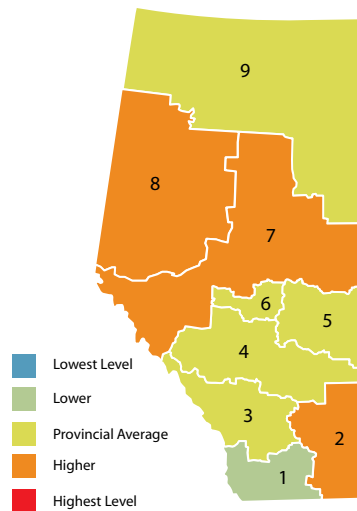
Age-standardized mortality rates for colorectal cancer: Chinook Health Region was high for females; Northern Lights Health Region was low for males.
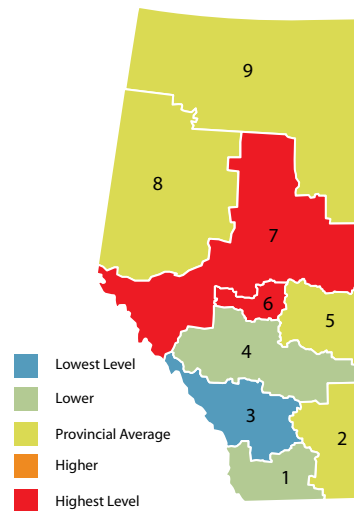
Figure 19a: **Age-Standardized Mortality Rates for Colorectal Cancer by Regional Health Authority, 2002–2004**

Figure 19b: **Female Age-Standardized Mortality Rates for Colorectal Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**
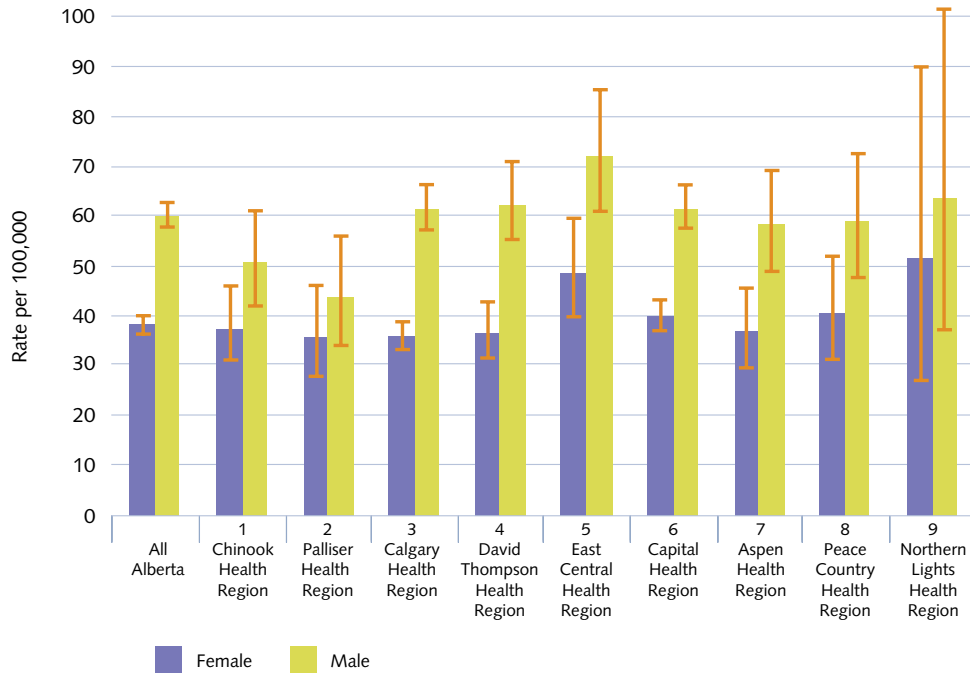

Figure 19c: **Male Age-Standardized Mortality Rates for Colorectal Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**

Female breast cancer rates

Age-standardized incidence rates for female breast cancer: these rates were lowest for Palliser and David Thompson Health Regions.

Figure 20a: **Female Age-Standardized Incidence Rates for Breast Cancer by Regional Health Authority, 2002–2004**
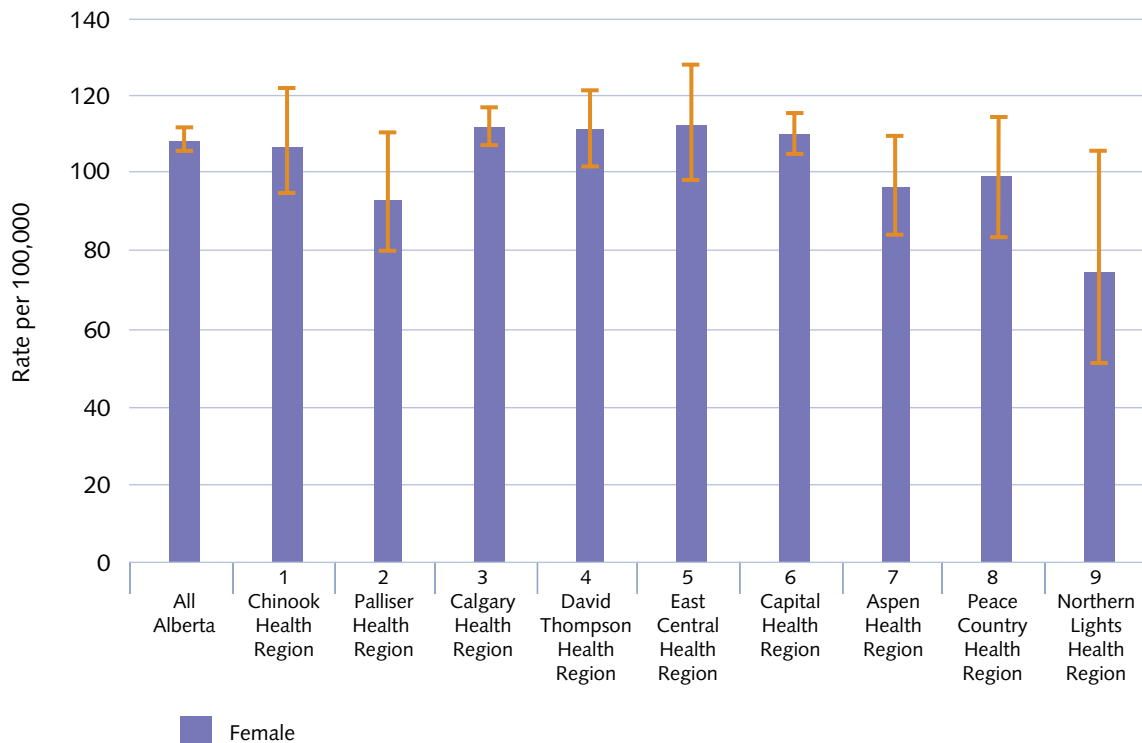
Figure 20b: **Female Age-Standardized Incidence Rates for Breast Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**

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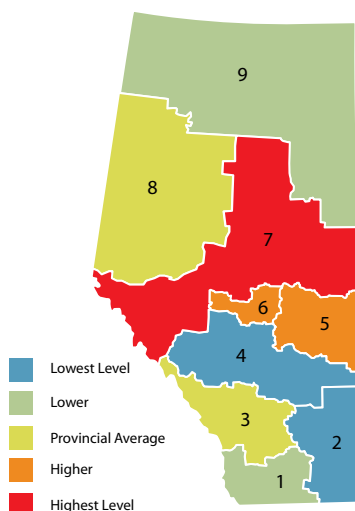
Age-standardized mortality rates for female breast cancer: these rates were relatively higher in David Thompson Health Region and lower in Northern Lights and Chinook Health Regions.

Figure 21a: **Female Age-Standardized Mortality Rates for Breast Cancer by Regional Health Authority, 2002–2004**
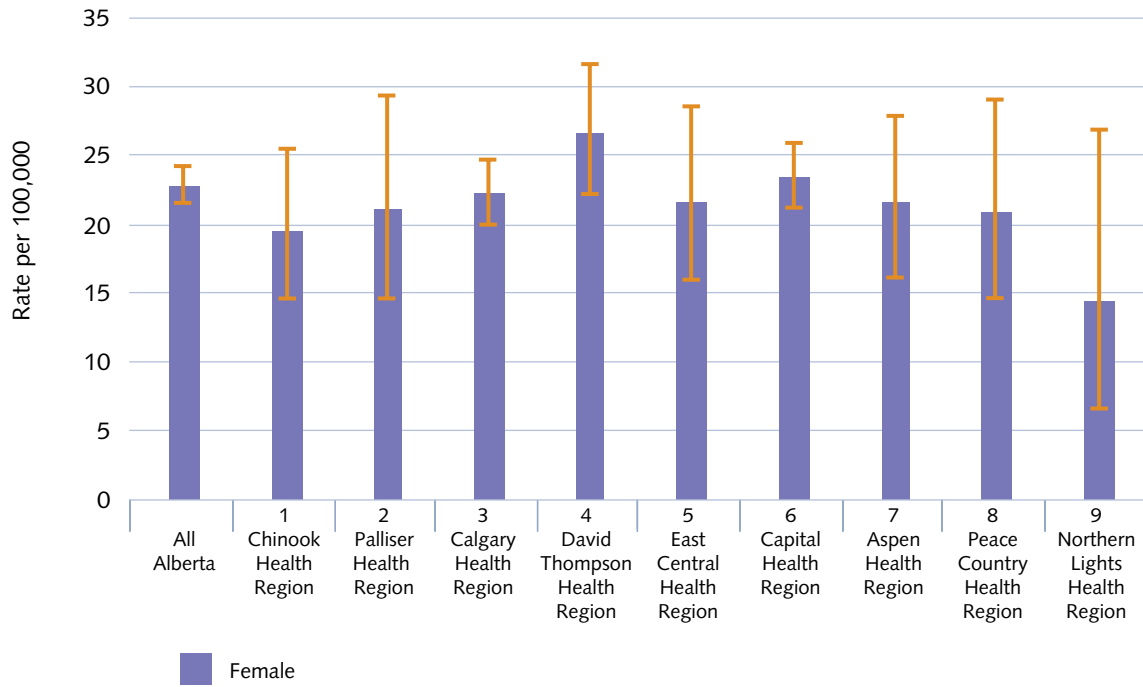
Figure 21b: **Female Age-Standardized Mortality Rates for Breast Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**
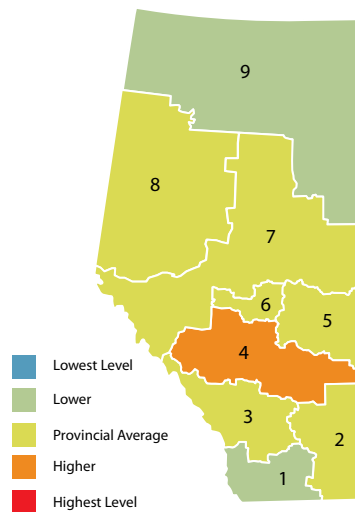

Early diagnosis of breast cancer by screening mammography for women over 50 can reduce breast cancer deaths by 30%.

Prostate cancer rates

Age-standardized incidence rates for prostate cancer: Palliser and David Thompson Health Regions had the lowest rates.

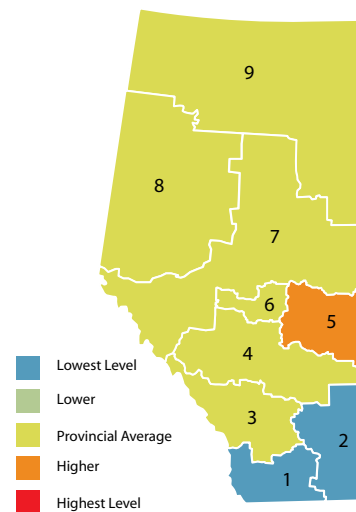**Figure 22a:** **Male Age-Standardized Incidence Rates for Prostate Cancer by Regional Health Authority, 2002–2004**
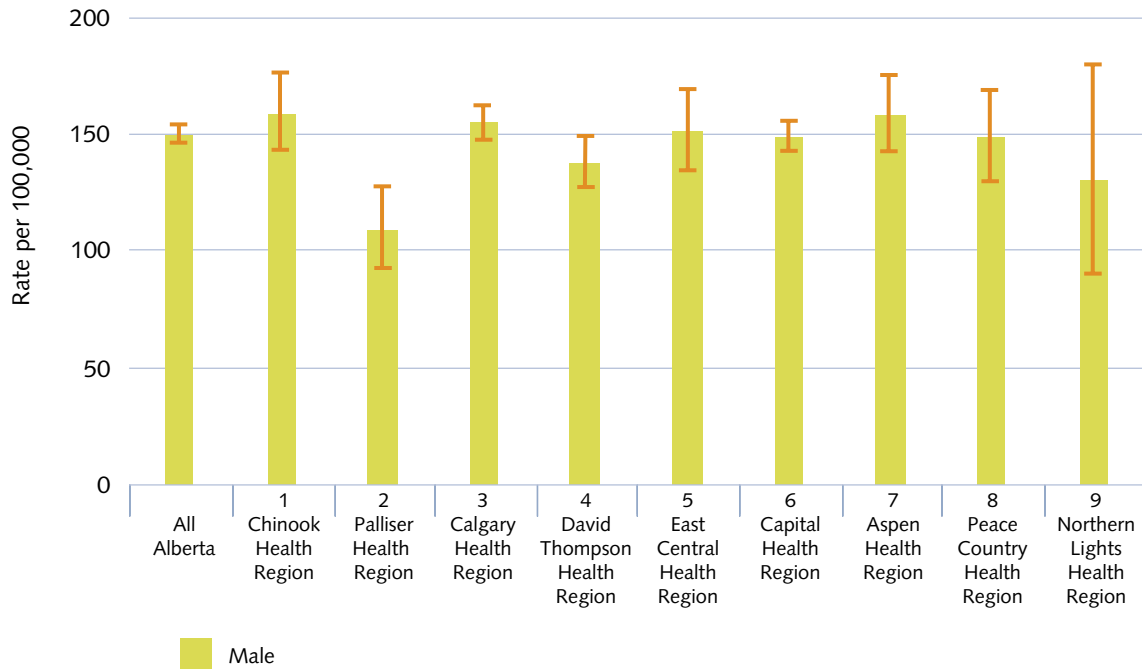
Figure 22b: **Male Age-Standardized Incidence Rates for Prostate Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**
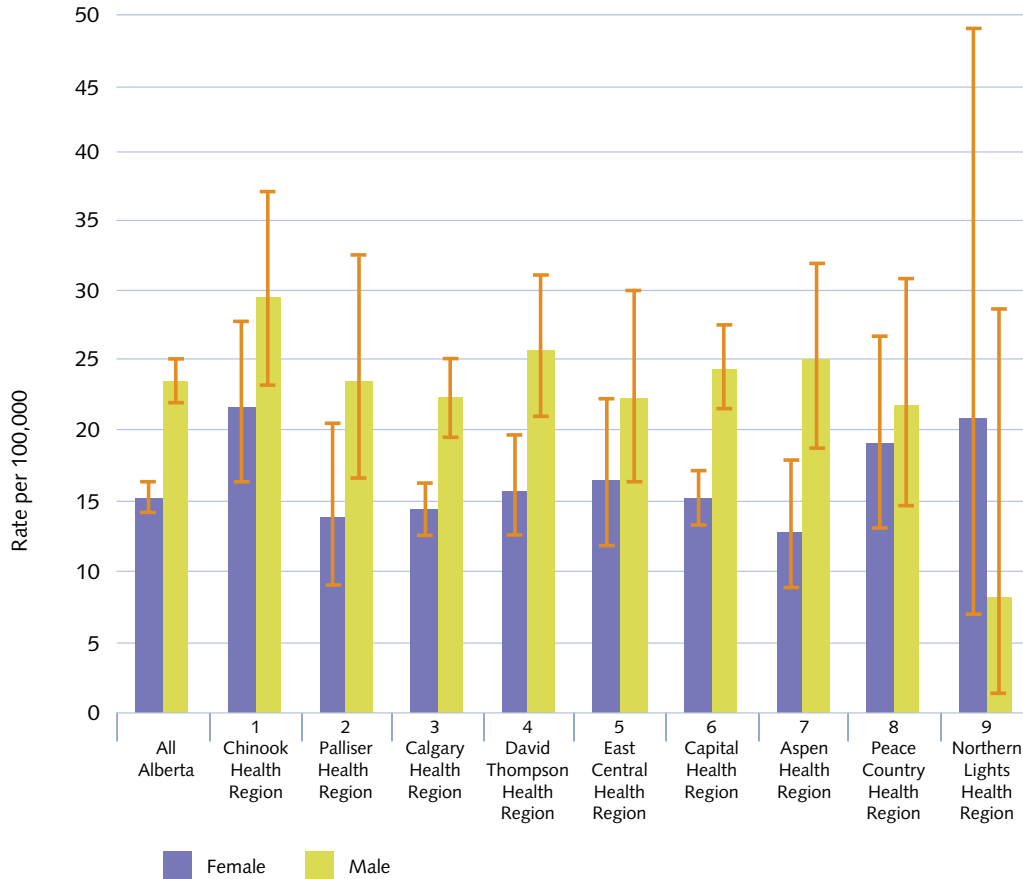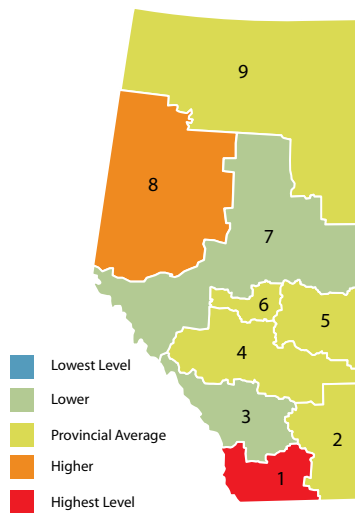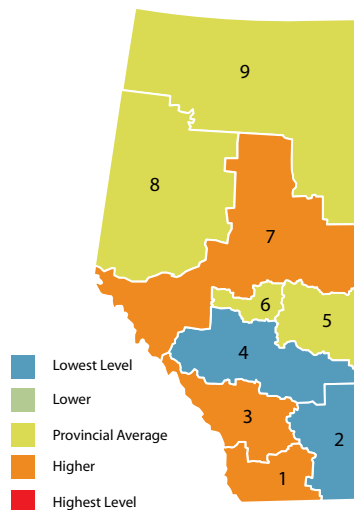
Age-standardized mortality rates for prostate cancer: Although Northern Lights Health Region had the largest observed value, it had a wide confidence interval. Chinook and Aspen Health Regions had the highest rates compared to the provincial average taking the variability into account; Capital Health Region had the lowest (see the introductory section to "Cancer rates by region" for details).

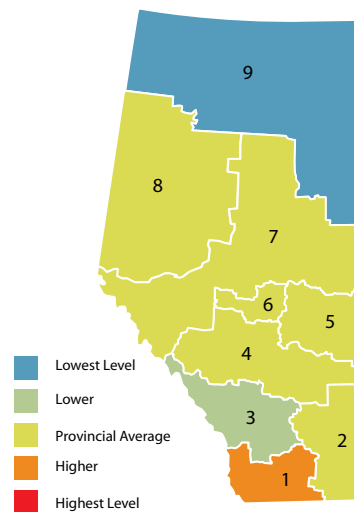**Figure 23a:**   **Male Age-Standardized Mortality Rates for Prostate Cancer by Regional Health Authority, 2002–2004**
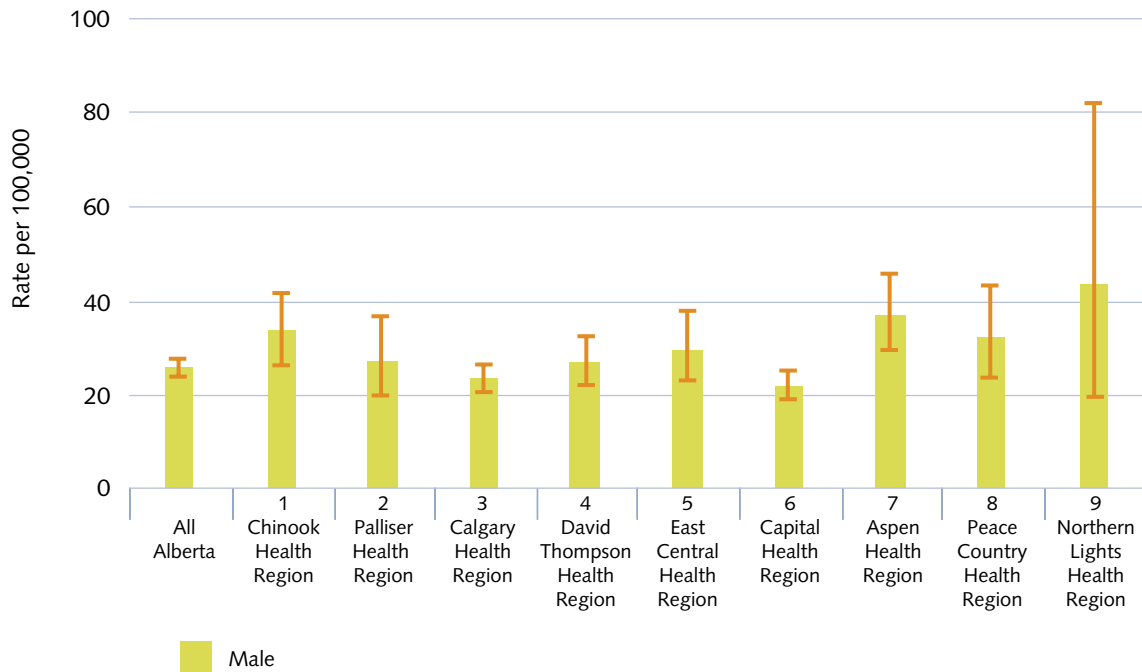
Figure 23b: **Male Age-Standardized Mortality Rates for Prostate Cancer by Regional Health Authority—Comparison with Provincial Average, 2002–2004**
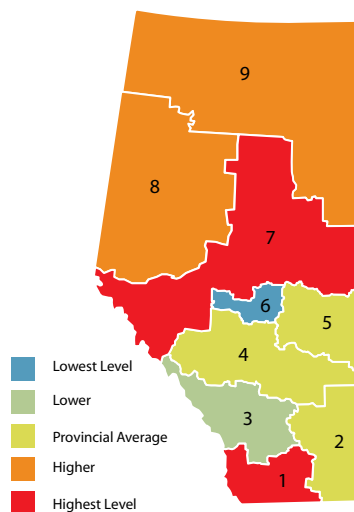
Glossary and Appendices

Glossary of terms

Age-standardized rates:
A weighted average of age-specific rates using a standard population distribution. They reflect the overall numbers that would be expected if the population of interest had an age structure identical to the standard population and are used to compare cancer rates among populations or identify trends over time.

Benign:
A tumour that is not malignant (i.e. does not spread).

Carcinoma:
A tumour that begins in the skin or in tissues that line or cover body organs.

Confidence intervals:
Indicate how precise a rate estimate is. A wide confidence interval indicates less precision and occurs when a population size is smaller.

Count:
Count refers to the number of cases (primaries) or deaths in a given time period. One patient may have multiple primaries.

Incidence:
The frequency of new cancer cases during a period of time; often the number of new invasive cases diagnosed in a year.

Invasive cancer:
Cancer with the ability to spread beyond its point of origin.

Life table:
A life table shows, for a person at each age, what the probability is that they die before their next birthday. From this starting point, a number of statistics can be derived and thus also included in the table:

> the probability of surviving any particular year of age;

> remaining life expectancy for people at different ages;

> the proportion of the original birth cohort still alive.

They are usually constructed separately for men and women because of their substantially different mortality rates.

Lymphatic system:
A system of vessels that carry lymph between lymph nodes located throughout the body.

Malignant:
Refers to a tumour that invades and destroys surrounding tissues, may spread elsewhere in the body, and is likely to recur after removal; a cancerous tumour.

Metastasis:
Refers to the spread of the original tumour to other parts of the body.

Mortality:
The number of deaths due to cancer during a period of time.

Period analysis:
A method of predicting survival for patients for whom complete follow-up information is still unknown. To estimate one-year survival probabilities, patients with follow-up reaching one-year from diagnosis are used. The estimates of two-year survival probabilities are based on patients whose follow-up since diagnosis reaches between one and two years, and so on.

Potential years of life lost (PYLL):
The number of years of life "lost" when a person dies prematurely from any cause; it was calculated by subtracting the age at which a person dies from the life expectancy in the life table at the present time in Canada.

Prevalence:

The number of people alive today (at a specific point in time) with cancer. Complete prevalence is the number of people alive today who have *ever* been diagnosed with cancer. Prevalence can sometimes relate to a different diagnosis time period. For example, a fifteen year prevalence is the number of people alive today who have been diagnosed with cancer during the past fifteen years. In this document, we report complete prevalence.

Probability of developing cancer:

The risk of an individual developing cancer computed in a given age range, and is conditional on the person being cancer-free prior to the beginning of the age range.

Rate:

The number of cases or deaths occurring in a specified population per year.

Relative survival:

The survival of cancer patients relative to that of the general population, assuming cancer was the only cause of death. It is the ratio of observed survival in a group of cancer patients relative to the expected survival of a similar group of people in the general public, matched by age and gender in Alberta.

Stage of cancer:

Refers to the extent of a cancer within the body. If the cancer has spread, the stage describes how far it has spread from the original site to other parts of the body.

Surveillance:

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

Tumour:

An abnormal mass of tissue that is not inflammatory, arises without obvious cause from cells of pre-existent tissue, and possesses no physiologic function.

Appendices

Cancer Incidence and Mortality in Alberta – Residents Diagnosed 2004

Data Sources

The data for these tables and the *Annual Report of Cancer Statistics* come from the Alberta Cancer Registry, which records and maintains data on all new primary cancers and cancer deaths occurring in the province as mandated by the Cancer Programs Act of Alberta. The Alberta Cancer Registry captures all invasive and in situ cancers diagnosed amongst Albertans, as well as borderline conditions and central nervous system tumours that have been seen at an Alberta Cancer Board facility.

The Alberta Cancer Registry is continually updating the registry database as new information becomes available. The data in this report are based on the registry data as of November 28, 2006.

The Alberta Cancer Registry learns of new cancers from a variety of sources. Laboratories throughout the province send a copy of each pathology report with a diagnosis of cancer to the nearest Alberta Cancer Board facility; the reports are then made available to the Registry. Other items that also may be received are operative reports, discharge summaries, x-ray reports of scans, and autopsy reports.

Alberta Vital Statistics sends the Alberta Cancer Registry an electronic file with a list of all deaths occurring in Alberta, which is linked to the Registry to identify cancer patients who have died. Information on date, cause, and place of death are captured. Autopsy data, if different from the original diagnosis, are also entered. Registry staff may modify the cause of death listed on the death certificate based on information available in the patient's medical record. Fewer than 1% of new cancer cases are registered through the death certificate only.

All data in this report relate only to those people who were resident in Alberta at the time of diagnosis or death.

Cancer Incidence and Mortality Counts and Rates

The figures presented in the body of this report give the large picture of cancer. In this appendix, the tables provide more detailed information to accompany the figures.

In these tables the different terms should be noted:

> An **incidence count** indicates the number of new cases of cancer diagnosed during a given period and for a **mortality count** it is the number of deaths due to cancer.

> An **incidence rate** is the ratio of the incidence count to the population size from which the counts were derived (unadjusted for age) and for a **mortality rate** the ratio is that of the mortality count to the population size.

The first table contains data on new cancer cases and rates for 2004 by age group and site for males and females. The second table looks at information on cancer deaths and rates for 2004, again by age group and site for both sexes. In addition, there is a summary table for selected sites.

For further information on cancer incidence and mortality, an excellent resource is the Alberta Cancer Board's *Annual Report of Cancer Statistics.*

Cancer Incidence Counts and Rates in Alberta 2004 by Site Site Rates are per 100,000 and age-adjusted to 1991 Canadian standard population (18 age groups)

Cancer Site	0–14		15–34		35–64		65–74		75+		Total Count			ASIR per 100,000		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	All	Male	Female	All
Head & Neck	0	0	2	7	117	45	60	24	41	31	220	107	327	14.3	6.3	10.1
Digestive Organs	1	1	13	5	529	334	405	259	462	488	1,410	1,087	2,497	97.4	62.1	78.6
Stomach	0	0	2	1	49	28	39	12	54	44	144	85	229	10.2	4.7	7.2
Colorectal	0	0	8	3	297	195	249	181	302	280	856	659	1,515	59.6	38	47.9
Pancreas	1	0	0	0	58	44	40	39	35	83	134	166	300	9.3	9.5	9.5
Other Digestive Organs	0	1	3	1	125	67	77	27	71	81	276	177	453	18.4	9.9	14
Respiratory & Intrathoracic Organs	0	1	3	3	288	258	281	247	296	224	868	733	1,601	60.9	45	51.9
Bronchus/Lung	0	0	3	2	279	256	264	242	279	223	825	723	1,548	57.8	44.3	50.2
Other Respiratory	0	1	0	1	9	2	17	5	17	1	43	10	53	3.1	0.7	1.8
Bones & Connective Tissue	5	7	12	6	25	14	15	4	9	12	66	43	109	4.5	2.6	3.5
Melanoma	0	0	12	38	146	150	53	24	50	42	261	254	515	17	14.9	15.8
Melanoma of Skin	0	0	12	37	138	138	51	20	41	38	242	233	475	15.7	13.6	14.5
Other Melanoma	0	0	0	1	8	12	2	4	9	4	19	21	40	1.3	1.3	1.2
Non-Melanoma Skin	1	0	42	53	1,158	1,078	727	495	942	856	2,870	2,482	5,352	197.4	142	166
Peripheral Nerves & Autonomic Nervous System	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0.1	0
Retroperitoneum & Peritoneum	2	3	0	0	6	18	4	13	1	12	13	46	59	0.8	2.8	1.9
Breast	0	0	0	27	3	1,099	3	386	5	357	11	1,869	1,880	0.7	108.9	
Female Genital Organs		1		50		417		130		143		741			44.1	
Cervix Uteri		0		36		90		5		16		147			9	
Endometrium		0		3		199		81		55		338			20.1	
Ovary		1		10		86		34		53		184			10.8	
Other Female Genital Organs		0		1		42		10		19		72			4.2	
Male Genital Organs	0		52		850		737		471		2,110			147		
Prostate Gland	0		0		788		730		468		1,986			138.8		
Other Male Genital Organs	0		52		62		7		3		124			8.2		
Urinary Tract	4	2	2	6	168	72	129	54	134	64	437	198	635	30.1	11.8	20.1
Bladder	2	0	1	0	48	12	68	14	86	22	205	48	253	14.9	2.8	8.2
Other Urinary Organs & Unspecified	2	2	1	6	120	60	61	40	48	42	232	150	382	15.2	9.1	11.9
Eye, Brain & Other CNS	12	4	13	7	61	33	19	11	11	15	116	70	186	7.5	4.2	5.8
Brain	10	4	13	6	60	31	18	11	11	15	112	67	179	7.3	4	5.6
Other Eyes and Brain	2	0	0	1	1	2	1	0	0	0	4	3	7	0.3	0.2	0.2
Thyroid & Other Endocrine Glands	2	2	13	56	48	178	6	17	4	12	73	265	338	4.5	16.1	10.3
Thyroid Gland	0	2	12	56	47	175	5	16	3	11	67	260	327	4.1	15.8	9.9
Other Endocrine Glands	2	0	1	0	1	3	1	1	1	1	6	5	11	0.4	0.3	0.3
Hematopoietic & Reticuloendothelial Systems	16	16	45	39	299	201	195	133	239	181	794	570	1,364	54.4	34	43.2
Non-Hodgkin's Lymphoma	6	1	19	10	126	82	83	53	75	76	309	222	531	20.9	13	16.7
Hodgkin's Lymphoma	2	5	12	18	28	19	5	1	5	3	52	46	98	3.2	2.9	3.1
Leukemia	8	9	12	8	72	47	44	28	62	40	198	132	330	13.5	7.9	10.4
Other Hematopoietic	0	1	2	3	73	53	63	51	97	62	235	170	405	16.7	10.2	13
Other & Ill-Defined Sites and Unknown Primary	2	0	0	2	40	36	35	27	56	89	133	154	287	9.5	8.4	9
All Sites	45	37	209	299	3,738	3,933	2,669	1,825	2,721	2,526	9,382	8,620	18,002	646.1	503.3	565
All Sites Excluding Non-Melanoma Skin	44	37	167	246	2,580	2,855	1,942	1,330	1,779	1,670	6,512	6,138	12,650	448.7	361.3	399.1

Cancer Mortality Counts and Rates in Alberta 2004 by Site Site Rates are per 100,000 and age-adjusted to 1991 Canadian standard population (18 age groups)

Cancer Site	0–14		15–34		35–64		65–74		75+		Total Count			ASMR per 100,000		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	All	Male	Female	All
Head & Neck	0	0	1	0	35	14	22	14	23	15	81	43	124	5.4	2.6	4.0
Digestive Organs	0	0	5	3	268	152	230	141	315	347	818	643	1,461	57.9	36.0	46.9
Stomach			0	1	42	19	27	10	44	31	113	61	174	7.9	3.4	5.6
Colorectal			2	1	93	66	98	66	169	156	362	289	651	26.4	16.2	21.3
Pancreas			1	1	51	35	49	40	39	97	141	173	313	9.8	9.8	9.8
Other Digestive Organs			2	0	82	32	56	25	63	63	203	120	323	13.9	6.6	10.3
Respiratory & Intrathoracic Organs	0	0	1	0	222	179	248	187	300	227	771	593	1,364	55.1	35.8	45.5
Lung			1	0	213	177	238	186	283	222	735	585	1,320	52.5	35.4	44.0
Other Respiratory	0	0	0	0	9	2	10	1	17	5	36	8	44	2.6	0.4	1.5
Bones & Connective Tissue	0	0	3	1	11	3	3	4	2	6	19	14	33	1.2	0.9	1.0
Melanoma	0	0	2	2	22	8	9	0	12	10	45	20	65	3.0	1.1	2.0
Melanoma of Skin			2	1	22	7	8	0	11	8	43	16	59	2.8	0.9	1.8
Other Melanoma			0	1	0	1	1	0	1	2	2	4	6	0.2	0.3	0.2
Non-Melanoma Skin	0	0	0	0	0	0	2	0	6	5	8	11	19	0.6	0.6	0.6
Retroperitoneum & Peritoneum	0	0	1	0	2	13	3	12	0	9	6	34	40	0.4	2.1	1.3
Breast	0	0	0	5	1	171	1	60	0	104	2	340	342	0.1	19.5	
Female Genital Organs		0		4		92		60		94		250			14.5	
Cervix Uteri				3		19		3		11		36			2.0	
Endometrium				0		12		19		21		52			3.1	
Ovary				1		50		32		49		132			7.7	
Other Female Genital Organs				0		11		6		13		30			1.8	
Male Genital Organs	1		3		32		66		222		324			25.0		
Prostate Gland	0		0		28		64		222		314			24.3		
Other Male Genital Organs	1		3		4		2		0		10			0.7		
Urinary Tract	1	2	1	0	52	18	53	20	73	50	180	90	270	13.0	5.1	9.0
Bladder	0	0	0	0	21	5	27	7	48	18	96	30	126	7.1	1.7	4.4
Other Urinary Organs & Unspecified	1	2	1	0	31	13	26	13	25	32	84	60	144	5.8	3.4	4.6
Eye, Brain & Other CNS	3	1	7	4	48	35	17	21	20	21	95	82	177	6.2	4.9	5.6
Brain	3	1	7	4	47	35	16	21	16	19	89	80	169	5.8	4.8	5.3
Other Eyes and Brain	0	0	0	0	1	0	1	0	4	2	6	2	8	0.5	0.1	0.3
Thyroid & Other Endocrine Glands	1	0	0	1	2	2	1	1	2	4	6	8	14	0.4	0.5	0.4
Thyroid Gland	0	0	0	0	2	2	1	1	1	4	4	7	11	0.2	0.4	0.3
Other Endocrine Glands	1	0	0	1	0	0	0	0	1	0	2	1	3	0.2	0.1	0.1
Hematopoietic & Reticuloendothelial Systems	3	1	8	2	86	52	85	46	136	128	318	229	547	22.6	12.9	17.8
Non-Hodgkin's Lymphoma	0	0	2	0	42	19	29	21	48	54	121	94	215	8.5	5.2	6.9
Hodgkin's Lymphoma	0	0	1	1	4	1	3	1	1	6	9	9	18	0.6	0.5	0.6
Leukemia	3	1	5	1	25	25	27	16	38	37	98	80	178	6.8	4.6	5.7
Other Hematopoietic	0	0	0	0	15	7	26	8	49	31	90	46	136	6.6	2.6	4.6
Other & Ill-Defined Sites	0	0	0	0	2	1	0	1	2	2	4	4	8	0.3	0.2	0.3
Unknown Primary	0	0	1	0	27	33	21	23	52	76	101	132	233	7.3	7.1	7.2
All Sites	9	4	33	22	811	779	761	590	1,165	1,098	2,779	2,493	5,272	198.6	143.9	166.9
All Sites Excluding Non-Melanoma Skin	9	4	33	22	811	773	759	590	1,159	1,093	2,771	2,482	5,253	197.9	143.3	166.3

Incidence and Mortality Counts and Rates for Most Frequently Diagnosed Cancer Sites in Alberta, 2004

Cancer site	Incidence						Mortality					
	Counts			Rates			Counts			Rates		
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Colorectal	856	659	1,515	59.6	38	47.9	362	289	651	26.4	16.2	21.3
Lung	825	723	1,548	57.8	44.3	50.2	735	585	1,320	52.5	35.4	44.0
Breast	11	1,869	1,880	0.7	108.9		2	340	342	0.1	19.5	
Prostate Gland	2,110			147			314			24.3		
Thyroid Gland	67	260	327	4.1	15.8	9.9	4	7	11	0.2	0.4	0.3
Others Excluding Non-Melanoma Skin	2,643	2,627	5,270	179.5	154.3	169.2	1,354	1,261	2,615	94.4	71.9	82.6
All Sites Excluding Non-Melanoma Skin	6,512	6,138	12,650	448.7	361.3	399.1	2,771	2,482	5,253	197.9	143.3	166.3

More about the Alberta Cancer Board and the Alberta Cancer Foundation

The Alberta Cancer Board is committed to reducing the burden of cancer through excellence in prevention, screening, diagnosis, treatment, palliation, education, and research. We provide a full range of cancer services and programs through two major centres, the Cross Cancer Institute in Edmonton and the Tom Baker Cancer Centre in Calgary, and through a network of 15 associate and community cancer centres across the province.

In addition to our care centres, the following divisions carry out the business of the Alberta Cancer Board as the provincial health authority responsible for cancer care:

Medical Affairs and Community Oncology (MACO) was created to ensure that the same quality of cancer services is available to all Albertans regardless of where they live, and is particularly focused on the delivery of cancer care to rural centres.

The Division of *Population Health & Information* (PHI) is focused on the front-end of the cancer spectrum to determine and have an impact on the environmental, biological and behavioural factors that lead to the development of cancer. The Division of PHI encompasses the following departments in addition to a Provincial Administration unit:

> *The Cancer Prevention Program* provides expertise, resources, linkages, training and evidence-based programming to health regions and other stakeholders in the area of cancer and chronic disease prevention.

> *Screening Programs* co-ordinate provincial screening programs on behalf of the Alberta Cancer Board including the Alberta Cervical Cancer Screening Program, the Alberta Breast Cancer Screening Program and the Alberta Colorectal Cancer Screening Program.

> *Population Health Research Unit* conducts epidemiologic research into population-based trends in cancer incidence, morbidity and mortality, the causes of cancer, prevention strategies and the early detection of cancer.

> *The Surveillance Group* provides ongoing surveillance and monitoring of cancer trends in Alberta by analyzing data collected by the Alberta Cancer Registry. A number of basic surveillance measures, such as incidence, mortality, survival, and probabilities of developing or dying of cancer, are generated and published.

> *The Alberta Cancer Registry* manages a population-based registry of cancer cases in the province.

> *The Integrated Cancer Care Network* (ICCN) provides a repository of clinical information on patients treated at an Alberta Cancer Board facility, and supports care, treatment and research.

> *The Information Privacy & Security Office* (IPSO) works to ensure the Alberta Cancer Board complies with provincial privacy legislation and maintains industry standards for information security.

> *Information Systems* improves productivity by minimizing system failures and building system redundancy, and managing hardware and software infrastructures for the ACB.

The Research Division co-ordinates the basic, applied, clinical and population-based research that is performed in the facilities and divisions of the Alberta Cancer Board.

The Alberta Cancer Foundation raises and receives funds on behalf of the Alberta Cancer Board. Alberta Cancer Foundation funding supports patient programs, equipment purchase and cancer care across Alberta; approximately 70% of Alberta Cancer Foundation funding goes to cancer research.

The Alberta Cancer Board is the first in Canada to set these measurable milestones:

By 2025, Alberta plans to:

> Reduce the incidence of cancers by 35%

> Reduce mortality of cancers by 50%

> Eradicate suffering for our patients

Cancer statistics on the web

The Alberta Cancer Board has redesigned the website: www.albertacancer.ca, to better serve the health information needs of Albertans.

In an effort to provide users of this report with access to more detailed data for specific cancer sites, we have added a cancer statistics section to the Alberta Cancer Board website. In previous years, *Cancer in Alberta: A Regional Picture* reported data for nine cancer sites; however, the 2006 and 2007 reports were streamlined to provide more detailed information on the cancer sites that most frequently affect Alberta's population. The new *Cancer in Alberta* section on the Alberta Cancer Board website provides a synopsis of data for a variety of cancer sites, including those not included in detail in this year's report.

The *Cancer in Alberta* section helps to illustrate the burden of cancer in Alberta through graphs and tables based on 2004 data compiled by the Alberta Cancer Registry. For each cancer site listed below, you will find information on incidence, mortality and survival rates as well as regional cancer statistics and trends.

For more information, visit
http://www.albertacancer.ca/CancerAlberta/CancerInAlberta/

> Lung	> Non-Hodgkin's Lymphoma
> Colorectal	> Pediatric
> Breast	> Pancreatic
> Prostate	> Endometrium
> Cervical	> Kidney
> Melanoma	> Ovarian
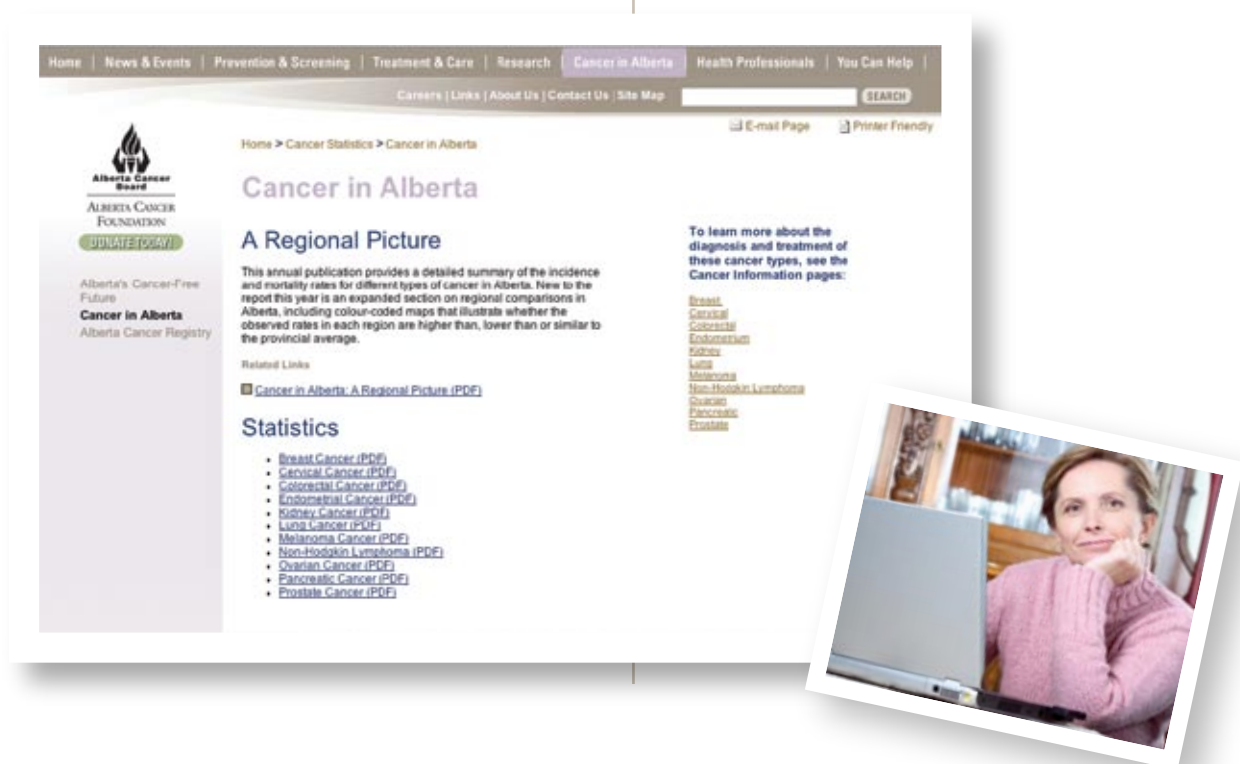
Resources for Health Professionals

Alberta Cancer Board Resources:

In addition to *Cancer in Alberta: A Regional Picture* report, the Alberta Cancer Board's Division of Population Health & Information produces a number of educational resources, train-the-trainer materials and reports for health professionals.

Cancer Prevention Resources

Prevention resources from the Alberta Cancer Board's Division of Population Health & Information can be downloaded in Adobe PDF format from the ACB website at:

http://www.albertacancer.ca/PS/Publications/

Cervical Cancer Screening Resources

Cervical cancer screening resources for health professionals and women are available on the Alberta Cervical Cancer Screening Program (ACCSP) website at:

http://www.albertacancer.ca/accsp/resources.html

Breast Cancer Screening Resources

Breast cancer screening resources for health professionals are currently available to download from the Alberta Cancer Board's Screen Test website at:

http://www.albertacancer.ca/screentest/resources_health.htm

Breast health educational resources for women are also listed (and some are available to download) on the Screen Test website at:

http://www.albertacancer.ca/screentest/resources.htm

The Alberta Breast Cancer Screening Program (ABCSP) is a province-wide initiative that will be fully implemented later in 2007. At that time, resources for health professionals and women will be available on the ABCSP website at:

http://www.albertacancer.ca/ABCSP/

Cancer Surveillance and Statistics

In addition to *Cancer in Alberta: A Regional Picture* report, the ACB's Division of Population Health & Information also publishes the *Alberta Cancer Registry: Annual Report of Cancer Statistics.* This report is available to download on the ACB website at:

http://www.albertacancer.ca/CancerAlberta/AlbertaCancerRegistry/

Other Resources on Cancer Statistics:

Canadian Cancer Statistics 2007 Canadian Cancer Society/National Cancer Institute of Canada/Statistics Canada/Provincial and Territorial Cancer Registries/ Health Canada

Five-year Relative Survival from Prostate, Breast, Colorectal, and Lung Cancer Ellison LF, L. Gibbons L, and the Canadian Cancer Survival Analysis Group, Health Reports (Statistics Canada Catalogue 82-003), 2001, Vol. 13, No. 1: 23-34

Leading Cancers—Changes in Five-year Relative Survival Ellison LF, L. Gibbons L, Health Reports (Statistics Canada Catalogue 82-003), 2004, Vol. 15, No. 2

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