Alberta Health Services

Cancer Care

Cancer Surveillance

Lung Cancer

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2010 Report on Cancer Statistics in Alberta

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Table of Contents

Purpose of the Report

Cancer Surveillance is a specialized team within Alberta Health Services, Cancer Care, that actively contributes to Alberta Health Service's goal of creating the best-performing publicly funded health system in Canada. This is accomplished by conducting cancer ***surveillance*** through the collection, integration, analysis and dissemination of cancer related data and information.

The report is designed to provide comprehensive and detailed information regarding cancer in Alberta. It will help support health professionals, researchers and policy makers in the planning, monitoring and evaluation of cancer-related health programs and initiatives. It will also be a useful education tool for the general public and media.

Navigating the Report

This document provides information on lung cancer statistics in Alberta. Details about other individual cancer types are available within separate documents. The words highlighted in ***dark blue*** are terms described in detail in the Glossary within the **Appendix** document.

Data Notes

In this document, the term "cancer" refers to ***invasive cancers*** unless otherwise specified. It is important to note that this document contains both actual and estimated data; distinctions are made where applicable. The numbers published in this report should be considered provisional, as a few cases and deaths may be registered in subsequent years. The data in this report reflect the state of the Alberta Cancer Registry as of July 31, 2012.

For detailed descriptions about data sources and how they affect data presented in this report, please see the **Appendix** document.

Summary

- Approximately **1 in 12** men and **1 in 14** women will develop invasive lung cancer within their lifetime.
- In 2010, **21,160** potential years of life were lost due to lung cancer.
- As of December 31, 2010, approximately **4,150** Albertans were alive who had previously been diagnosed with lung cancer.
- From 1990 to 2010*, **male** lung cancer **incidence rates have decreased** while **female** lung cancer **incidence rates increased** over the period 1993-2008*.
- From 1990 to 2010*, **male** lung cancer **mortality rates have decreased** while **female** lung cancer **mortality rates have increased** over the period 1990 to 2000*.
- In 2010, there were **1,839** new cases of lung cancer in Alberta and **1,445** deaths due to the disease.
- Approximately **1,670** cases of lung cancer are expected to be diagnosed in 2015.
- The five-year relative survival ratio for lung cancer in Alberta is approximately **15%** for those diagnosed between 2008 and 2010.

In 2010, there were 1,839 new cases of lung cancer in Alberta and 1,445 deaths due to the disease.

The five-year relative survival ratio for lung cancer in Alberta is approximately 15% for those diagnosed between 2008 and 2010.

*Year range represents the period over which the most recent significant trend was observed.

Demography

The increase in the number of new cases of lung cancer over the last two decades is mainly attributable to changes in demography (aging of the population and population growth), as compared to the minor change in the lung cancer rate (***Figure 5-1***).

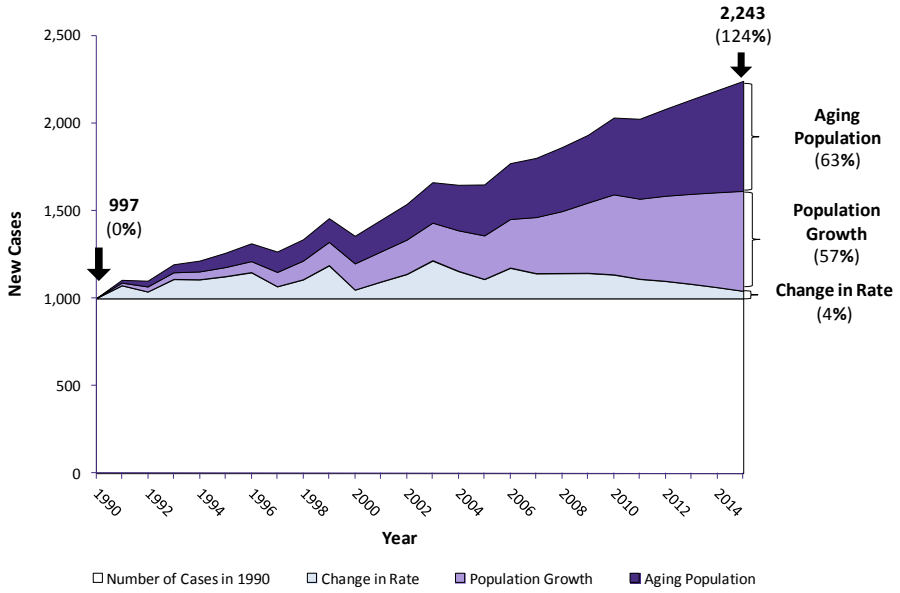
The horizontal black line indicating 997 new cases in ***Figure 5-1*** represents the number of lung cancer cases that occurred in 1990. In 2015, approximately 2,250 new lung cancer cases are projected to occur; accounting for a 124% increase in cases from 1990.The line at the top of the dark purple-shaded area of the graph represents the number of new cases that actually occurred between 1990 and 2009, projected to 2015. Between these two lines, the three colored areas reflect the increase in lung cancer cases due to the impact of rate change, population growth and aging population.

The light blue shaded area (lower) represents the total number of new lung cancer cases that would have occurred each year if lung cancer incidence rates alone had changed but the population size and age structure had remained the same as in 1990. This will account for an approximately 4% in the total new lung cancer cases in 2015.

The light purple shaded area (middle) represents the number of new lung cancer cases that would have occurred each year if the population alone had grown larger, assuming the age distribution and lung cancer incidence rates had remained the same as in 1990. This will account for an approximately 57% in the total new lung cancer cases in 2015.

The dark purple shaded area (top) represents the number of new lung cancer cases attributed to increases in the older adult population - the aging population, assuming the population size and lung cancer incidence rate had remained the same as in 1990. This will account for an approximately 63% in the total new lung cancer cases in 2015.

Figure 5-1: **Trends in New Cases of Lung Cancer Attributed to Aging Population, Population Growth and Change in Lung Cancer Rate, Both Sexes Combined, Alberta, 1990-2015**



Data Sources: Alberta Cancer Registry, Alberta Health

The trends of new lung cancer cases are different between males and females. In 1990, there were 320 new cases in females and 677 new cases in males. In 2015, however, approximately 1,150 new cases are projected to occur in females, accounting for 260% increase from 1990, where 146% will be due to the change in female lung cancer rate, 57% due to the population growth, and 56% is due to aging population. About 1,100 new lung cancer cases are estimated to occur in males in 2015, accounting for 61% increase from 1990, where 58% increase in new male lung cancer cases will be due to population growth, and 73% due to aging population, adjusted by a 69% reduction in male lung cancer rate.

Probability of Developing and Dying from Lung Cancer

The ***probability of developing or dying of cancer*** measures the risk of an individual in a given age range developing or dying of cancer, and is conditional on the person being lung cancer-free prior to the beginning of that age range.

It is important to note that the probabilities of developing and dying of cancer represent all of Alberta's population on average and should be interpreted with caution at the individual level as the probabilities will be affected by the risk behaviours of the individual. In addition, someone diagnosed with cancer has a higher probability of developing another cancer in the future.[1]

The probability of developing lung cancer increases with age and varies by sex (***Table 5-1***). Approximately 1 in 12 males and 1 in 14 females will develop invasive lung cancer in their lifetime.

On a population basis the probability of developing lung cancer by the end of the age range for a lung cancer-free individual at the beginning of the age range are shown in the bottom eight rows of ***Table 5-1***. For instance, a lung cancer-free female representative of the general population at age 40 has a 1 in 576 chance of developing lung cancer by the time she is 50.

The probability of dying from lung cancer increases with age and varies by sex (***Table 5-2***). Approximately 1 in 15 males and 1 in 18 females will die of invasive lung cancer.

On a population basis the probability of a cancer-free individual at the beginning of the age range dying from lung cancer by the end of the age range are shown in the bottom eight rows of ***Table 5-2***. For example, a cancer-free female representative of the general population at age 40 has a 1 in 1,010 chance of dying from lung cancer by the time she is 50.

Table 5-1: **Probability of Developing Lung Cancer by Age and Sex, Alberta, 2006-2010**

Age Group (Years)	Males	Females
Lifetime Risk (all ages)	1 in 12	1 in 14
0 - 20	Less than 1 in 10,000	Less than 1 in 10,000
20 - 30	Less than 1 in 10,000	Less than 1 in 10,000
30 - 40	1 in 9,169	1 in 5,656
40 - 50	1 in 832	1 in 576
50 - 60	1 in 154	1 in 143
60 - 70	1 in 48	1 in 51
70 - 80	1 in 25	1 in 35
80+	1 in 22	1 in 36

Data Sources: Alberta Cancer Registry, Alberta Health

Table 5-2: **Probability of Dying from Lung Cancer by Age and Sex, Alberta, 2006-2010**

Age Group (Years)	Males	Females
Lifetime Risk (all ages)	1 in 15	1 in 18
0 - 20	Less than 1 in 10,000	Less than 1 in 10,000
20 - 30	Less than 1 in 10,000	Less than 1 in 10,000
30 - 40	Less than 1 in 10,000	Less than 1 in 10,000
40 - 50	1 in 1,399	1 in 1,010
50 - 60	1 in 222	1 in 231
60 - 70	1 in 67	1 in 75
70 - 80	1 in 34	1 in 47
80+	1 in 23	1 in 38

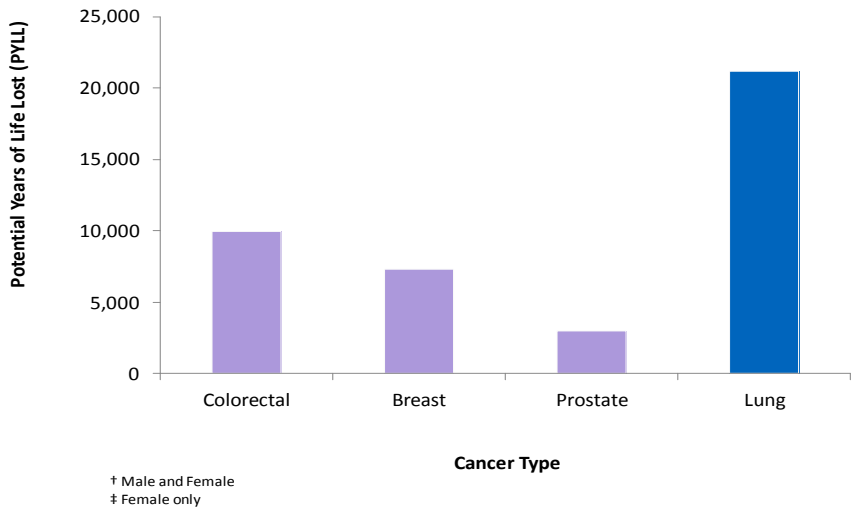
Data Sources: Alberta Cancer Registry, Alberta Health

Potential Years of Life Lost

One frequently used measure of premature death is ***potential years of life lost (PYLL)***. PYLL due to cancer is an estimate of the number of years that people would have lived had they not died from cancer. PYLL due to cancer has been calculated by multiplying the number of deaths in each age group and the absolute difference between the mid-point age of an age group and the age-specific life expectancy. The age-specific life expectancy is calculated by determining the age to which an individual would have been expected to live had they not died from cancer. PYLL is one way to measure the impact, or burden, of a disease on a population.

In 2010, **21,160** potential years of life were lost due to lung cancer, which constitutes about 25% of PYLL for all cancers (***Figure 5-2***). Lung cancer is the largest single site contributor to PYLL.

Figure 5-2: **Potential Years of Life Lost (PYLL) from Lung Cancer† Compared with Colorectal†, Breast‡ and Prostate, Alberta, 2010**



Data Source: Alberta Cancer Registry

Prevalence

The ***prevalence*** of a disease is defined as the number of people alive at a given time point who had been previously diagnosed with that disease.

Limited-duration lung cancer prevalence represents the number of people alive on a certain day who had previously been diagnosed with lung cancer within a specified time period (e.g. 2, 5, 10 or 20 years) while complete lung cancer prevalence represents the number of people alive on a certain day who had previously been diagnosed with lung cancer, regardless of how long ago the diagnosis was.[2]

In this section of the report, both limited-duration and complete lung cancer prevalence are presented; the latter describing the number of people alive as of December 31, 2010 who had ever been diagnosed with lung cancer.

Prevalence is a useful indicator of the impact of cancer on individuals, the healthcare system and the community as a whole. Although many cancer survivors lead healthy and productive lives, the experience can have a strong impact on the physical and emotional well-being of individuals and their families. The cancer experience can also result in the continued use of the healthcare system through rehabilitation or support services, as well as loss of work productivity that can affect the whole community.

Table 5-3: **Limited-Duration and Complete Prevalence for Lung Cancer, Both Sexes Combined, Alberta, 2010**

Duration	Prevalence
2-Year	1,670
5-Year	2,617
10-Year	3,284
20-Year	3,827
Complete	4,136

Data Source: Alberta Cancer Registry

As of December 31, 2010, approximately **4,150** Albertans were alive who had previously been diagnosed with lung cancer (***Table 5-3***), out of which approximately **1,650** Albertans were alive on the same date who had been diagnosed with lung cancer in the previous two years, the period during which cases are more likely to receive definitive treatments.

Lung Cancer Incidence and Mortality

Incidence counts are the number of new cancer cases diagnosed during a specific time period in a specific population. In this section of the report, incidence counts refer to the number of new lung cancer diagnoses in Albertan residents in a calendar year. Incidence rates are the number of new lung cancer cases diagnosed per 100,000 population in a specific time period.

Mortality counts describe the number of deaths attributed to cancer during a specific period of time in a specific population. In this section of the report, mortality refers to the number of deaths due to lung cancer in Albertan residents in a calendar year, regardless of date of diagnosis. Mortality rates are the number of deaths per 100,000 population in a specific time period.

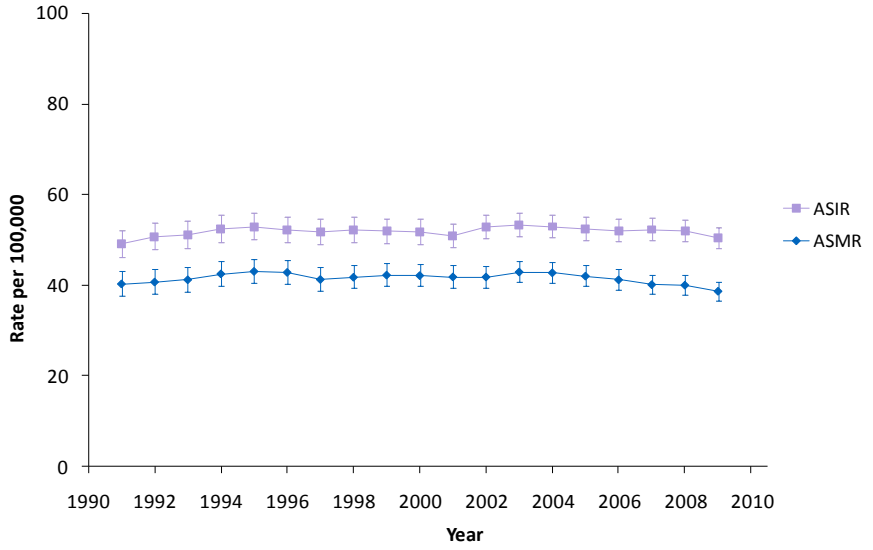
In order to compare cancer incidence or cancer mortality over time or between populations, ***age-standardized incidence rates (ASIRs)*** or ***age-standardized mortality rates (ASMRs)*** are presented. These are weighted averages of ***age-specific rates*** using a standard population to determine the weights. These rates are useful because they are adjusted for differences in age distributions in a population over time, which permit comparisons of cancer incidence or mortality among populations that differ in size, structure and/or time period. ASIRs and ASMRs give the overall incidence and mortality rates that would have occurred if the population of Alberta had been the same as the standard population. In this report the Canadian 1991 population is used as the standard population.

Three-year moving averages are used to smooth out year-to-year fluctuations so that the underlying trend may be more easily observed. They are calculated based on aggregating three years of data by age group. Age-standardized incidence rates (ASIRs) and age-standardized mortality rates (ASMRs) are presented as three-year moving averages. This smoothing of trends is especially important when the number of cancer cases per year is relatively small, where year-to-year variability can be quite large.

Incidence and mortality can be affected by a variety of factors; implementation of public health prevention or screening strategies that either prevent disease or find cancer in its early ***stages*** when treatment is generally more successful, the development of cancer treatment programs that may impact chances of survival and research innovations.

The following figures show incidence and mortality trends for lung cancer in Alberta. Separate analyses for both incidence and mortality are shown in subsequent sections. The statistical significance of the trends was determined by using Joinpoint[3] method and is described in the text accompanying each graph. Joinpoint models are based on yearly rates; hence there may be slight differences in the rates presented in the text (from Joinpoint model) and the graphs (where ASIRs and ASMRs are shown as three-year moving averages).

Figure 5-3: **Age-Standardized Incidence Rates (ASIRs)*† and Age-Standardized Mortality Rates (ASMRs)*† and 95% Confidence Intervals (CI) for Lung Cancer, Both Sexes Combined, Alberta, 1990-2010**



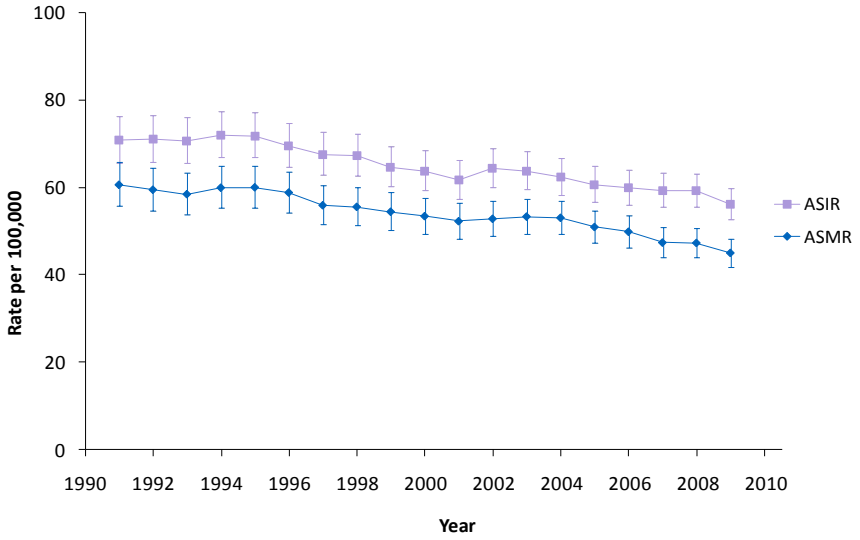
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

ASIRs for lung cancer in both sexes combined have not changed significantly since 1990 (***Figure 5-3***). In 2010, the ASIR for lung cancer in both sexes combined was 47 per 100,000 population.

Mortality rates are lower than incidence rates (***Figure 5-3***). Lung cancer mortality rates in both sexes combined remained stable between 1990 and 2005. Between 2005 and 2010, the ASMR for lung cancer in both sexes combined has decreased significantly by 2.6% annually. In 2010, the ASMR for lung cancer in both sexes combined was 37 per 100,000 population.

Figure 5-4: **Age-Standardized Incidence Rates (ASIRs)*† and Age-Standardized Mortality Rates (ASMRs)*† and 95% Confidence Intervals (CI) for Lung Cancer, Males, Alberta, 1990-2010**



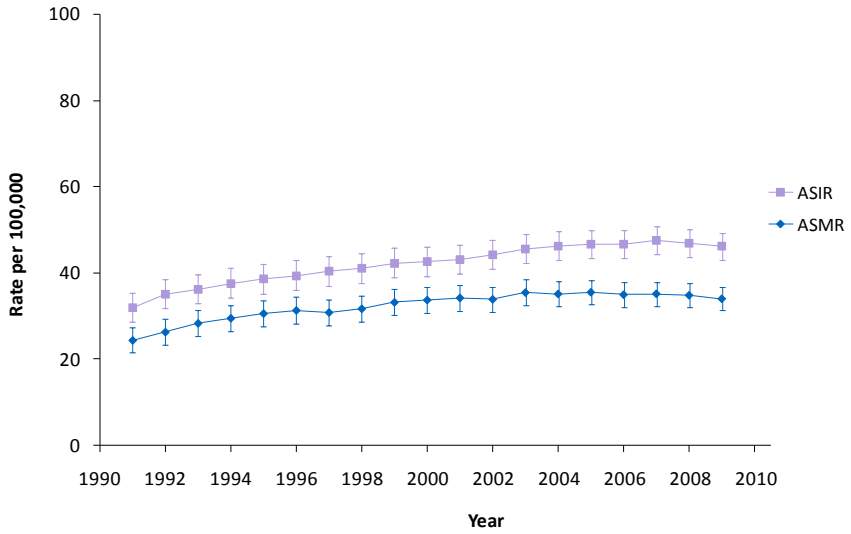
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

Male lung cancer ASIRs decreased significantly between 1990 and 2010 by 1.4% annually (***Figure 5-4***). In 2010, the ASIR for lung cancer in males was 51 per 100,000 male population.

Male mortality rates are lower than male incidence rates. Male lung cancer ASMRs decreased significantly between 1990 and 2010 by 1.6% annually (***Figure 5-4***). In 2010, the ASMR for lung cancer in males was 43 per 100,000 male population.

Figure 5-5: **Age-Standardized Incidence Rates (ASIRs)[*†] and Age-Standardized Mortality Rates (ASMRs)[*†] and 95% Confidence Intervals (CI) for Lung Cancer, Females, Alberta, 1990-2010**



* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

Female lung cancer ASIRs increased significantly between 1990 and 1993 (***Figure 5-5***) by 8.9% annually then continued to increase at lower rate between 1993 and 2008 by 1.7% annually. These rates remained stable from 2008 to 2010. In 2010, the ASIR for lung cancer in females was 45 per 100,000 female population.

Female mortality rates are lower than incidence rates. Female lung cancer ASMRs increased significantly by 3.7% annually between 1990 and 2000 and remained stable between 2001 to 2010 (***Figure 5-5***). In 2010, the ASMR for lung cancer in females was 32 per 100,000 female population.

Lung Cancer Incidence

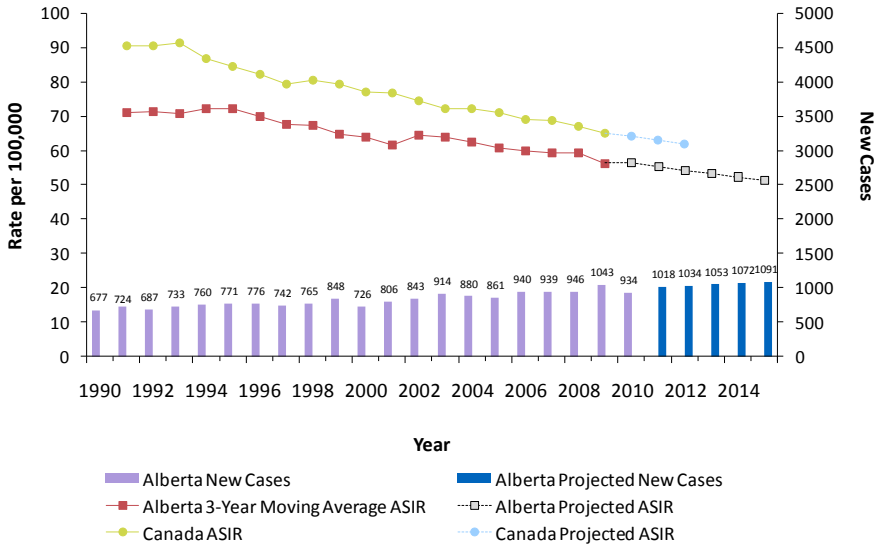
The following five figures (***Figures 5-6*** **to** ***5-10***) provide information on lung cancer incidence in Alberta. The number of new cancer cases in Alberta is affected not only by changes in the incidence rates, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized incidence rates (ASIRs) are also provided.

In ***Figures 5-6*** and ***5-7*** observed age standardized incidence rates are shown for 1990-2009, and ***projected*** rates for 2010 -2015, and observed numbers of new lung cancer cases are shown for the years 1990-2010 and projected numbers for 2011-2015.

The projected cancer numbers were calculated by applying the estimated age-specific cancer incidence rates to the projected age-specific population figures provided by Alberta Health.[4] These were observed up to 2009 and estimated for 2010-2015. Caution should be exercised when comparing Canada[5] and Alberta rates as Canadian rates are yearly rates while Alberta rates are three-year moving averages.

The estimated lung cancer incidence rates were calculated by extrapolating the historical trends in age-specific rate based on data for 1985-2009.

Figure 5-6: **Actual and Projected Number of New Cases and Age-Standardized Incidence Rates (ASIRs)*† for Lung Cancer, Males, Alberta, 1990-2015**



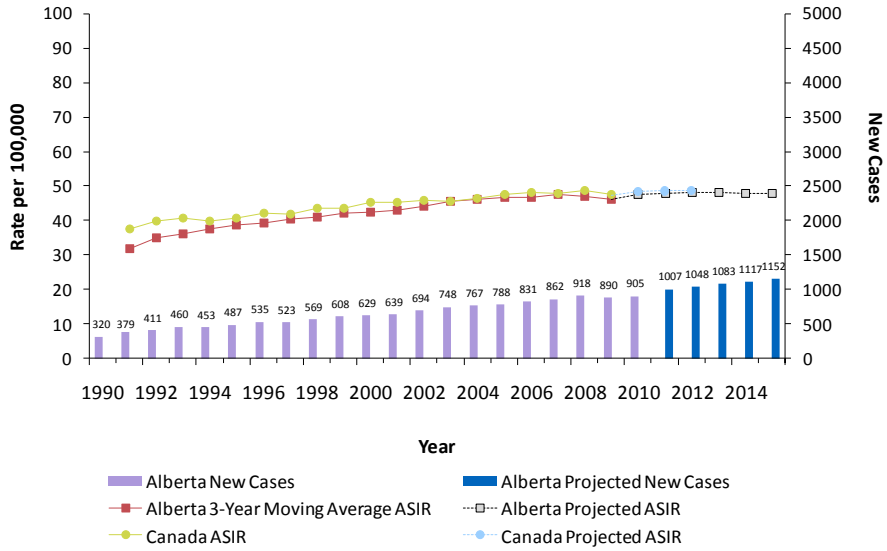
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health, Canadian Cancer Society

In 2010, 934 cases of male lung cancer were diagnosed in Alberta (***Figure 5-6***). Alberta ASIRs for male lung cancer were lower than those in Canada.

Approximately 1,100 cases of male lung cancer will be diagnosed in Alberta in 2015.

Figure 5-7: **Actual and Projected Number of New Cases and Age-Standardized Incidence Rates (ASIRs)*† for Lung Cancer, Females, Alberta, 1990-2015**



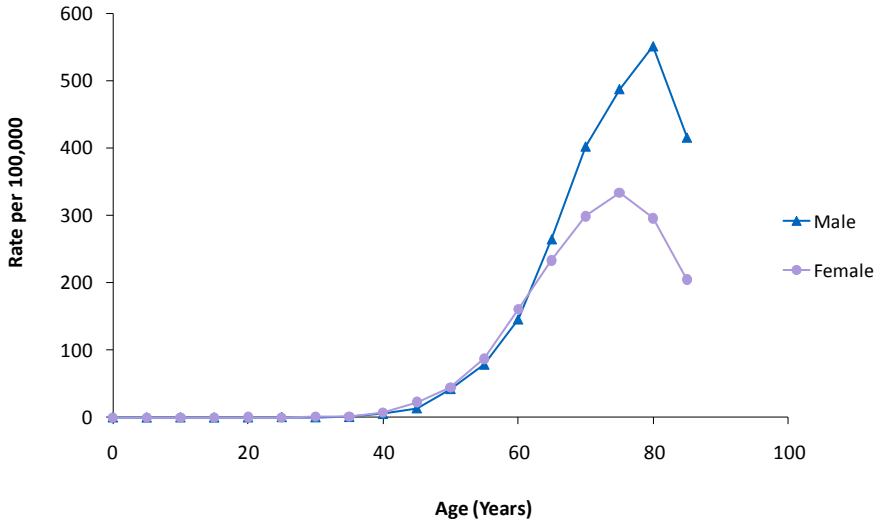
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health, Canadian Cancer Society

In 2010, 905 cases of female lung cancer were diagnosed in Alberta (***Figure 5-7***). Alberta ASIRs for female lung cancer were generally lower than those in Canada.

Approximately 1,150 cases of female lung cancer will be diagnosed in Alberta in 2015.

Figure 5-8: **Age-Specific Incidence Rates for Lung Cancer by Sex, Alberta, 2006-2010**

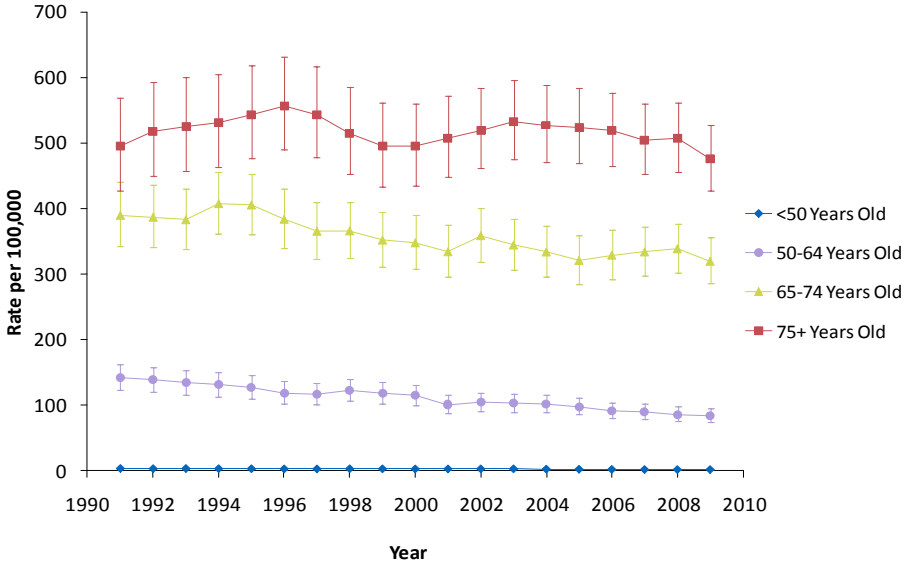


Data Sources: Alberta Cancer Registry, Alberta Health

Male and female lung cancer incidence rates differ by age (***Figure 5-8***). Age-specific incidence rates for lung cancer in both sexes combined increase rapidly after the age of 40. Female rates are similar to male rates until the age of 60 after which female incidence rates are lower compared to incidence rates in males.

Male incidence rates peaks at around age 80 and then decline, whereas female incidence rates peak at around age 75 and decline thereafter (***Figure 5-8***).

Figure 5-9: **Age-Standardized Incidence Rates (ASIRs)[*†] and 95% Confidence Intervals (CI) for Lung Cancer, Ages <50, 50-64, 65-74, and 75+, Males, Alberta, 1990-2010**



[*] Three-year moving average.
[†] Standardized to 1991 Canadian population.

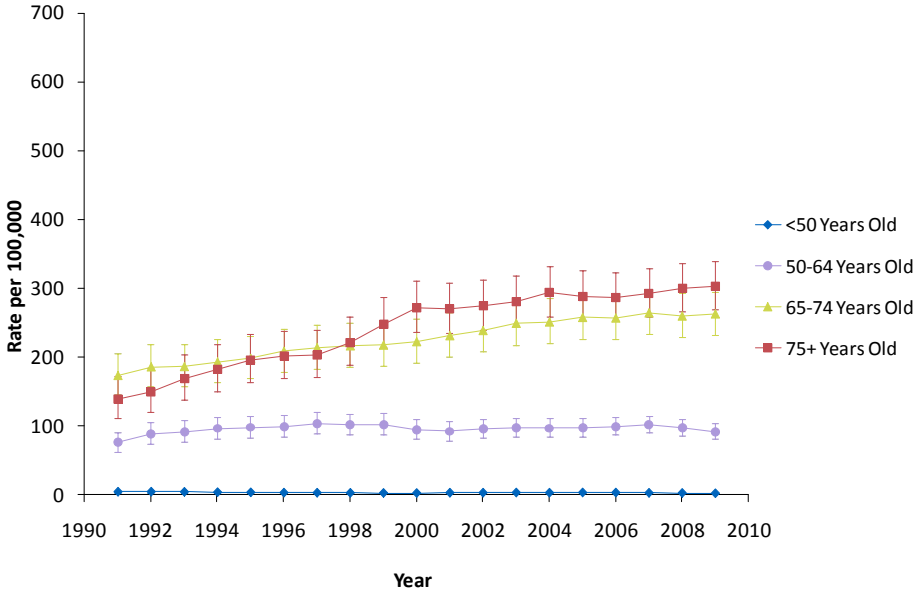
Data Sources: Alberta Cancer Registry, Alberta Health

The trends in age-standardized lung cancer incidence rates for males differ across all four age groups (***Figure 5-9***).

Lung cancer incidence rates for males decreased significantly over the period 1990 to 2010 for the age groups <50 years, 50-64 years and 65-74 years by 3.2%, 2.8%, and 1.3% annually, respectively.

Male lung cancer incidence rates for the 75+ age group were the highest among the age groups but did not change significantly between 1990 and 2010.

Figure 5-10: **Age-Standardized Incidence Rates (ASIRs)[*†] and 95% Confidence Intervals (CI) for Lung Cancer, Ages <50, 50-64, 65-74, and 75+, Females, Alberta, 1990-2010**



[*] Three-year moving average.
[†] Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

Trends in age-standardized lung cancer incidence rates for females differ across age groups (***Figure 5-10***).

Between 1990 and 2010, the lung cancer incidence rates of females decreased significantly for the age group <50 years by 2.2% annually, remained stable for the age group 50-64 years and increased significantly for the age group 65-74 years by 2.3% annually. For the age group 75+ years, female lung cancer incidence rates increased significantly by 7.4% annually between 1990 and 2000, but remained stable between 2000 and 2010.

Lung Cancer Mortality

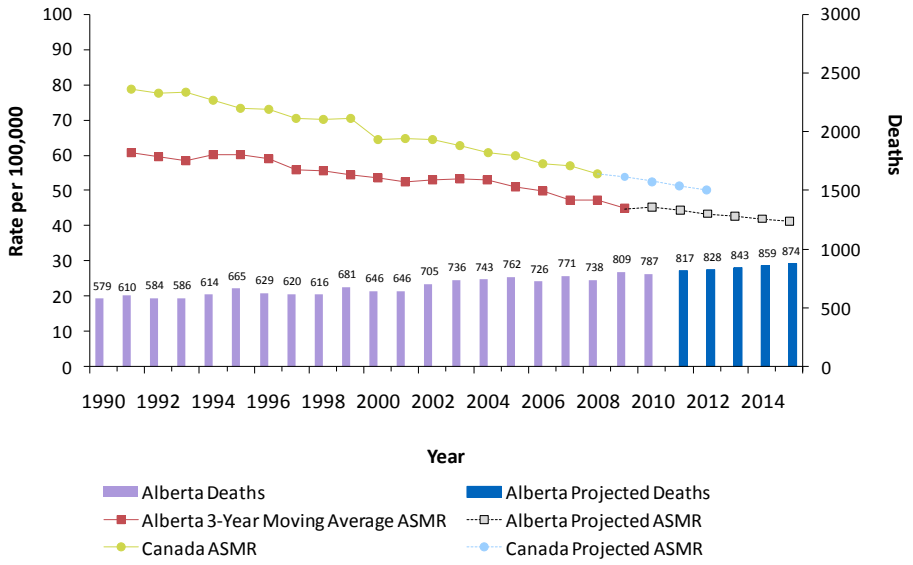
The following five figures (***Figures 5-11*** **to** ***5-15***) provide information on lung cancer mortality in Alberta. The number of deaths in Alberta is affected not only by changes in the mortality rates, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized mortality rates (ASMRs) are also provided.

In ***Figures 5-11*** and ***5-12*** observed age standardized mortality rates are shown for 1990-2009, and ***projected*** rates for 2010 -2015, and observed numbers of cancer deaths are shown for the years 1990-2010 and projected numbers for 2011-2015.

The projected numbers of cancer deaths were calculated by applying the estimated age-specific cancer mortality rates to the age-specific population figures provided by Alberta Health[4]. These were observed up to 2009 and estimated for 2010-2015. Caution should be exercised when comparing Canada[5] and Alberta rates as Canadian rates are yearly rates while Alberta rates are three-year moving averages.

The estimated lung cancer mortality rates were calculated by extrapolating the historical trends in age-specific rate based on data in 1985-2009.

Figure 5-11: **Actual and Projected Number of Deaths and Age-Standardized Mortality Rates (ASMRs)*† for Lung Cancer, Males, Alberta, 1990-2015**



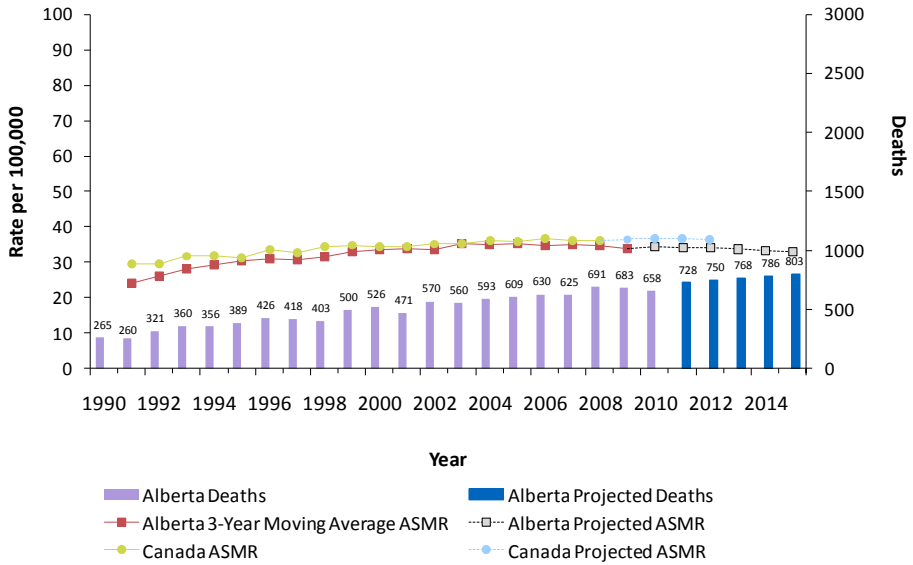
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health, Canadian Cancer Society

In 2010, 787 males died of lung cancer in Alberta (***Figure 5-11***). Alberta ASMRs for male lung cancer were lower than those in Canada.

Approximately 870 males are expected to die from lung cancer in Alberta in 2015.

Figure 5-12: **Actual and Projected Number of Deaths and Age-Standardized Mortality Rates (ASMRs)*† for Lung Cancer, Females, Alberta, 1990-2015**



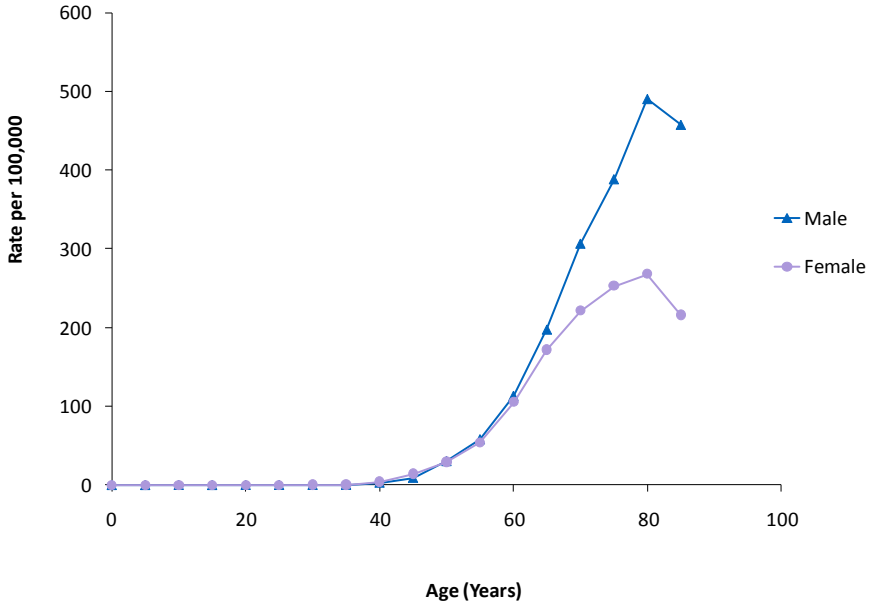
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health, Canadian Cancer Society

In 2010, 658 females died of lung cancer in Alberta (***Figure 5-12***). Alberta ASMRs for female lung cancer were generally lower than those in Canada.

Approximately 800 females are expected to die from lung cancer in Alberta in 2015.

Figure 5-13: **Age-Specific Mortality Rates for Lung Cancer by Sex, Alberta, 2006-2010**

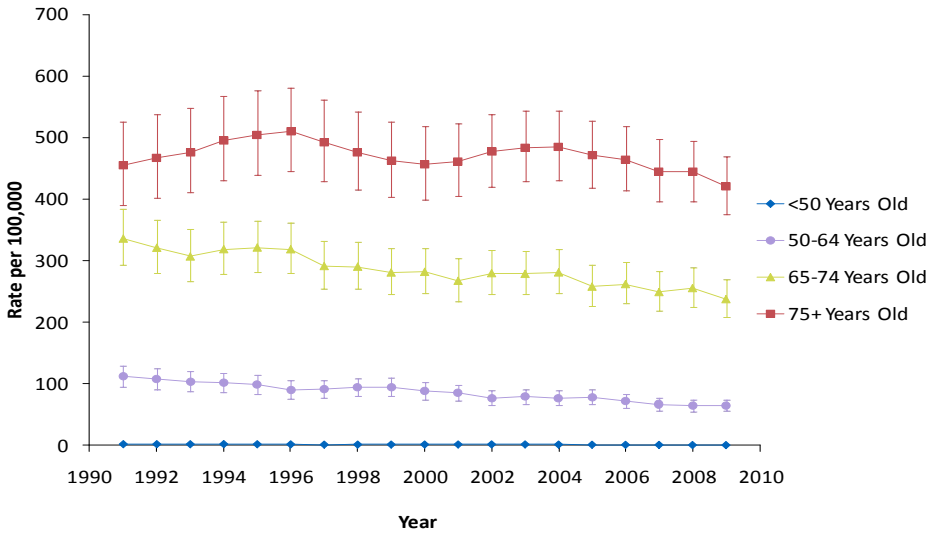


Data Sources: Alberta Cancer Registry, Alberta Health

Male and female lung cancer mortality rates differ by age and sex (***Figure 5-13***). Age-specific mortality rates for lung cancer in both sexes combined increase rapidly after about the age of 45. Female rates are similar to male rates until about the age of 60 after which female mortality rates are lower compared to mortality rates in males. Male and female mortality rates peaks at around age 80 and then decline. The highest lung cancer mortality rates occur in the older age groups.

The trends in age-standardized lung cancer mortality rates in males vary over time and by age group (***Figure 5-14***).

Figure 5-14: **Age-Standardized Mortality Rates (ASMRs)[*†] and 95% Confidence Intervals (CI) for Lung Cancer, Ages <50, 50-64, 65-74, and 75+, Males, Alberta, 1990-2010**



[*] Three-year moving average.
[†] Standardized to 1991 Canadian population.

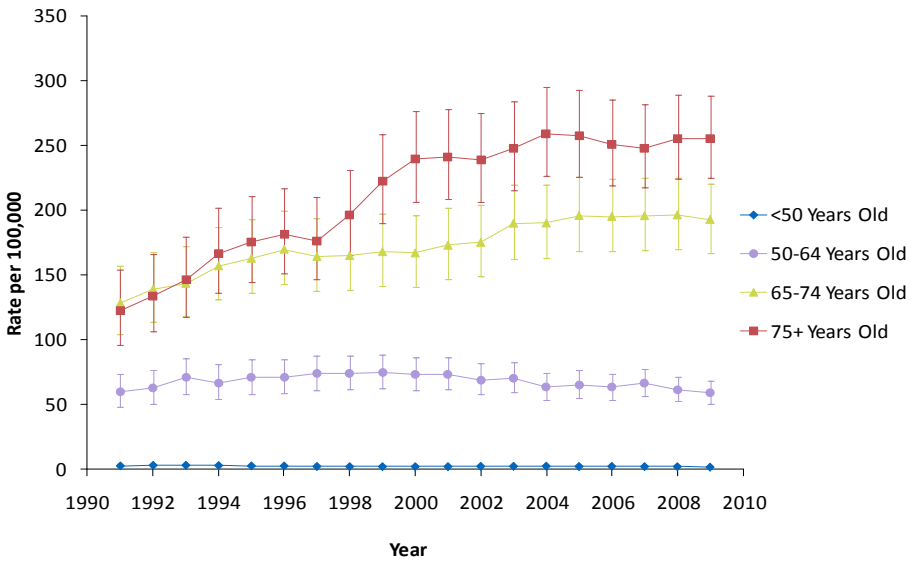
Data Sources: Alberta Cancer Registry, Alberta Health

Between 1990 and 2003, male lung cancer mortality rates in the <50 age group did not change significantly, but decreased significantly between 2003 and 2010 by 11.3% annually.

Male lung cancer mortality rates for those in the 50-64 and 65-74 age groups decreased significantly between 1990 and 2010 by 2.9% and 1.8% annually, respectively.

Male lung cancer mortality rates for those over 75 increased significantly between 1990 and 1995 by 3.5% annually, but decreased significantly between 2003 and 2010 by 2.6% annually.

Figure 5-15: **Age-Standardized Mortality Rates (ASMRs)*† and 95% Confidence Intervals (CI) for Lung Cancer, Ages <50, 50-64, 65-74, and 75+, Females, Alberta, 1990-2010**



* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

The trends in age-standardized lung cancer mortality rates for females vary over time and by age group (***Figure 5-15***).

Between 1990 and 2010**,** female mortality rates for lung cancer decreased significantly in the <50 age group by 2.4% annually.

Between 1990 and 1999**,** female mortality rates for lung cancer remained stable in the 50-64 age groups, but decreased significantly by 2.7% annually since 1999.

Female lung cancer mortality rates for those in the age group 65-74 increased significantly by 1.9% annually between 1990 to 2010.

Female lung cancer mortality rates in the 75+ age group increased significantly between 1990 and 2000 by 7.6% annually, but remained stable between 2000 and 2010.

Lung Cancer Survival

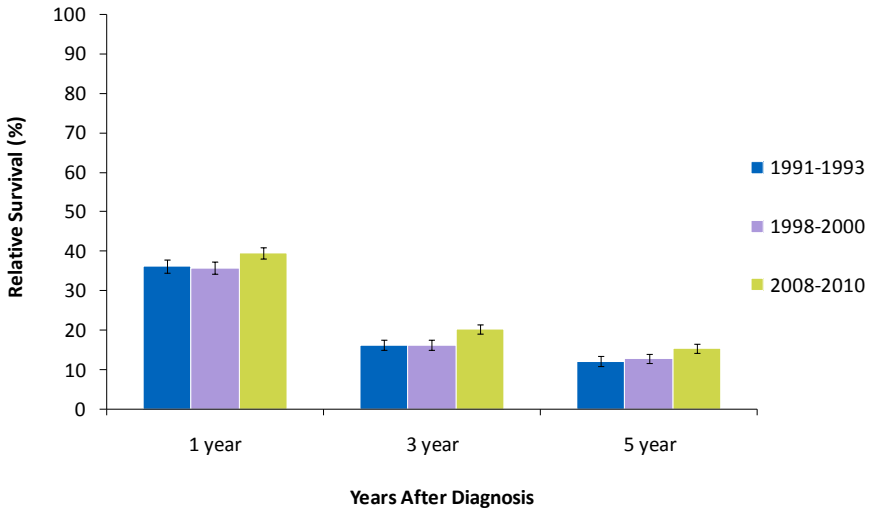
Cancer survival ratios indicate the proportion of people who will be alive at a given time after they have been diagnosed with cancer. Survival is an important outcome measure and is used for evaluating the effectiveness of cancer control programs. Survival depends on several factors including the cancer type (most importantly site, morphology and stage at diagnosis), sex, age at diagnosis, health status and available treatments for that cancer. While ***relative survival ratios*** (RSRs) give a general expectation of survival over the whole province, these ratios may not apply to individual cases. Individual survival outcomes depend on the stage at diagnosis, treatment and other individual circumstances.

Relative survival ratios are estimated by comparing the survival of cancer patients with that expected in the general population of Albertans of the same age, sex and in the same calendar year. In this section of the report, RSRs are standardized by the age structure in the standard cancer patient population (i.e. all persons who were diagnosed with that cancer in Canada between 1992 and 2001) to permit RSRs to be compared over time, independent of differences in age distribution of cancer cases.

RSRs are estimated by the ***cohort method***[6] when complete follow-up data (e.g., at least five years of follow-up to estimate five-year rate) after diagnosis are available. For recently diagnosed cases, whose complete follow-up data are not available, the up-to-date estimates are computed using the ***period method.***[7] However, comparison between cohort and period RSRs should be interpreted with caution because of the two different methods used to derive the respective ratios.

The relative survival ratio is usually expressed as a percentage (%) and the closer the value is to 100%, the more similar the survival pattern is to the general population.

Figure 5-16: **Age-Standardized One, Three and Five-Year Relative Survival Ratios and 95% Confidence Intervals (CI) for Lung Cancer, Both Sexes Combined, Alberta, 1991-1993*, 1998-2000* and 2008-2010†**



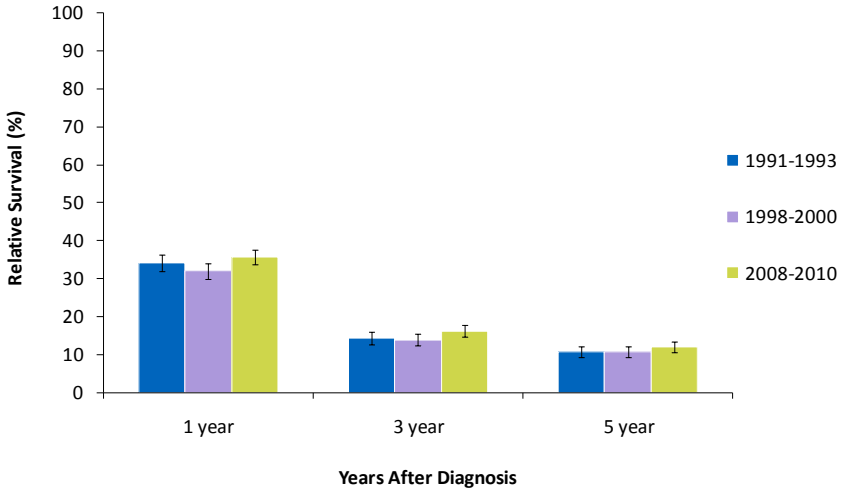
* Ratios calculated by cohort method, where complete follow-up data are available.
† Ratios calculated by period method, where complete follow-up data are not available.

Data Sources: Alberta Cancer Registry, Statistics Canada

The five-year relative survival ratio for individuals diagnosed with lung cancer in the period 2008-2010 is an estimated 15%, indicating that out of all individuals diagnosed with this cancer between 2008 and 2010, around 15% are as likely to be alive five years after diagnosis as individuals from the general population of the same age.

There has been no change in the five-year relative survival ratios for individuals diagnosed with lung cancer in 2008-2010 compared to those diagnosed in 1991-1993 (***Figure 5-16***).

Figure 5-17: **Age-Standardized One, Three and Five-Year Relative Survival Ratios and 95% Confidence Intervals (CI) for Lung Cancer, Male, Alberta, 1991-1993*, 1998-2000* and 2008-2010†**



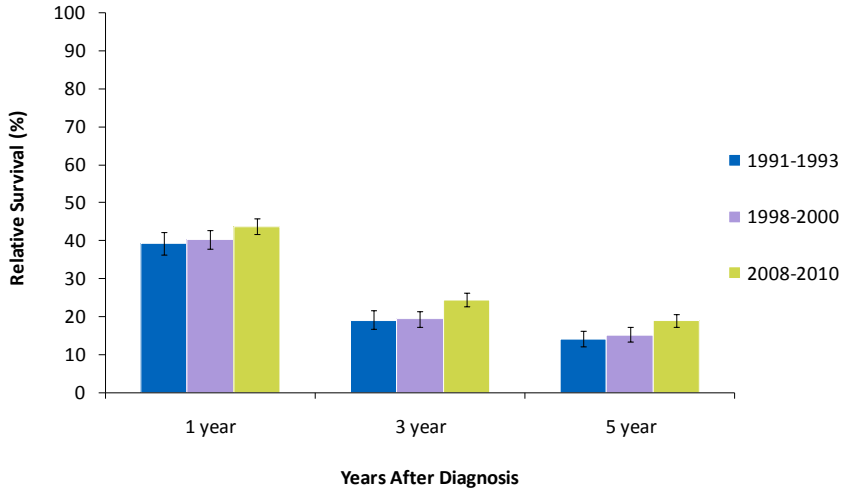
* Ratios calculated by cohort method, where complete follow-up data are available.
† Ratios calculated by period method, where complete follow-up data are not available.

Data Sources: Alberta Cancer Registry, Statistics Canada

The five-year relative survival ratio for males diagnosed with lung cancer in the period 2008-2010 is an estimated 12% indicating that out of males diagnosed with this cancer between 2008 and 2010, around 12% are as likely to be alive five years after diagnosis as males from the general population of the same age.

There has been no change in the five-year relative survival ratios for males diagnosed with lung cancer in 2008-2010 compared to those diagnosed in 1991-1993 (***Figure 5-17***).

Figure 5-18: **Age-Standardized One, Three and Five-Year Relative Survival Ratios and 95% Confidence Intervals (CI) for Lung Cancer, Females, Alberta, 1991-1993*, 1998-2000* and 2008-2010†**



* Ratios calculated by cohort method, where complete follow-up data are available.
† Ratios calculated by period method, where complete follow-up data are not available.

Data Sources: Alberta Cancer Registry, Statistics Canada

The five-year relative survival ratio for females diagnosed with lung cancer in the period 2008-2010 is an estimated 19% indicating that out of females diagnosed with this cancer between 2008 and 2010, around 19% are as likely to be alive five years after diagnosis as females from the general population of the same age.

There has been no change in the five-year relative survival ratios for females diagnosed with lung cancer in 2008-2010 compared to those diagnosed in 1991-1993 (***Figure 5-18***).

Geographic Variation

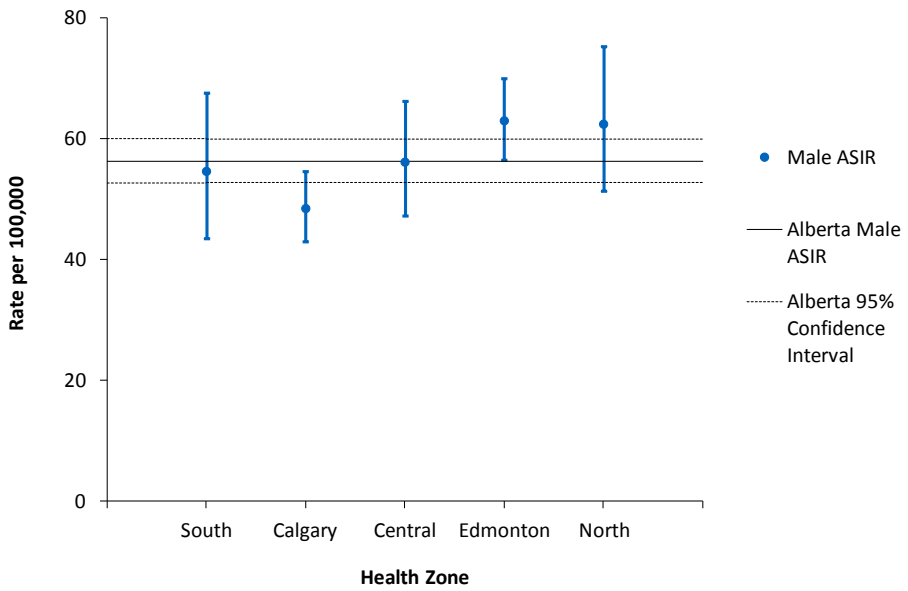
The geographic variation section illustrates how the observed lung cancer rates in each health zone compare with the provincial average. These rates are three-year averages. The age standardized incidence and mortality lung cancer rates for each zone and the province are presented with their corresponding 95% ***confidence intervals***.[8] Any observed differences in rates may be due to several factors such as regional differences in:

- risk factors such as smoking and obesity rates
- prevention efforts
- diagnostic activity
- access to cancer care[9]

Figure 5-19: **Five Health Zones in Alberta, 2010**

Source: Alberta Health Services

Figure 5-20: **Age-Standardized Incidence Rates (ASIRs)*† and 95% Confidence Intervals (CI) for Lung Cancer by Zones, Males, Alberta, 2008-2010**

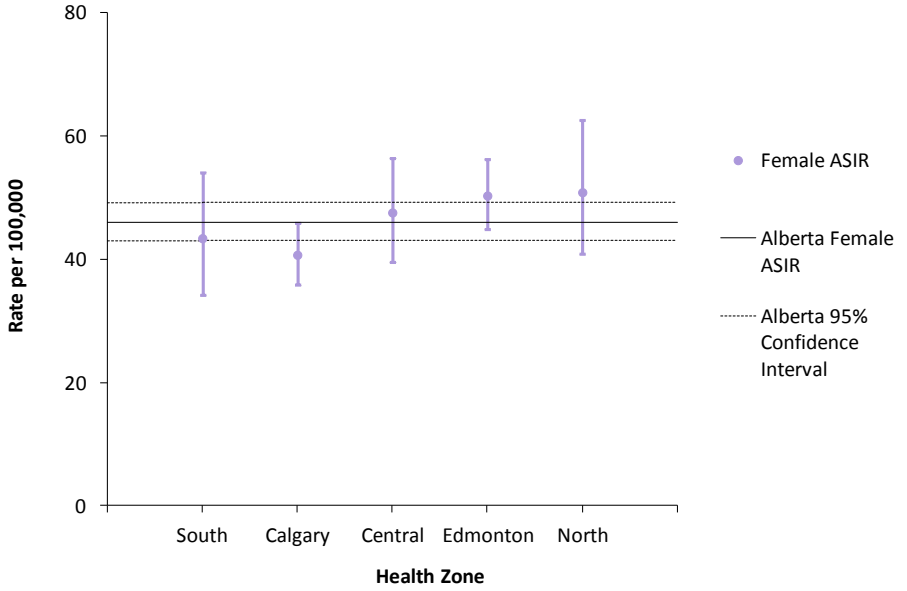


* Three-year average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

There is no evidence that male lung cancer ASIRs in each zone is significantly higher or lower than the provincial average (***Figure 5-20***).

Figure 5-21: **Age-Standardized Incidence Rates (ASIRs)*† and 95% Confidence Intervals (CI) for Lung Cancer by Zones, Females, Alberta, 2008-2010**

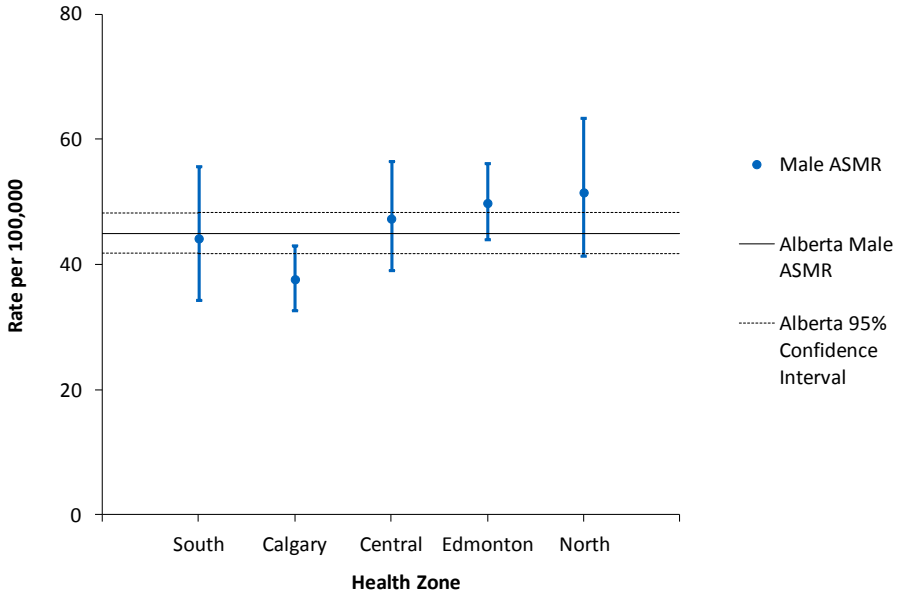


* Three-year average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

There is no evidence that female lung cancer ASIRs in each zone is significantly higher or lower than the provincial average (***Figure 5-21***).

Figure 5-22: **Age-Standardized Mortality Rates (ASMRs)*† and 95% Confidence Intervals (CI) for Lung Cancer by Zones, Males, Alberta, 2008-2010**

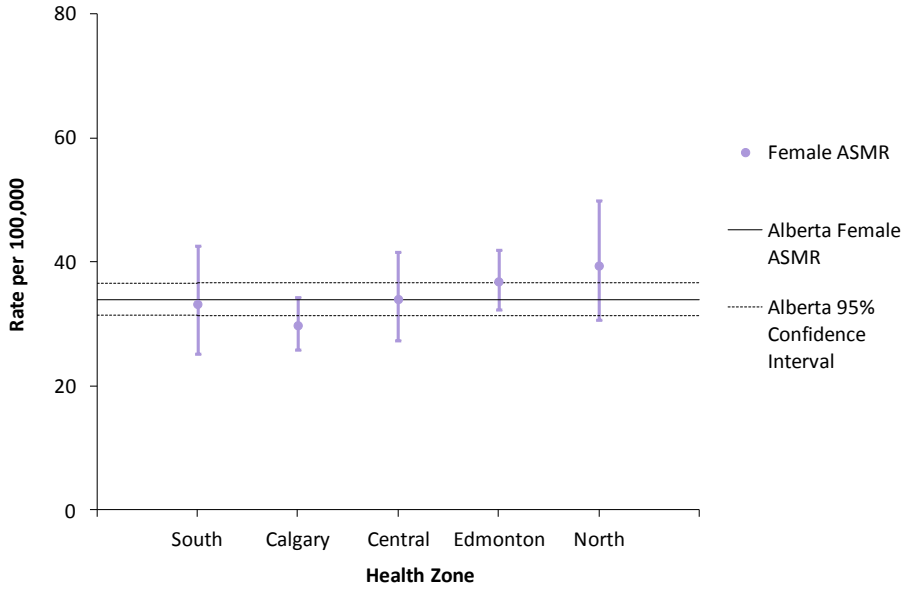


* Three-year average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

There is no evidence that male lung cancer ASMRs in each zone is significantly higher or lower than the provincial average (***Figure 5-22***).

Figure 5-23: **Age-Standardized Mortality Rates (ASMRs)*† and 95% Confidence Intervals (CI) for Lung Cancer by Zones, Females, Alberta, 2008-2010**



* Three-year average.
† Standardized to 1991 Canadian population.

Data Sources: Alberta Cancer Registry, Alberta Health

There is no evidence that female lung cancer ASMRs in each zone is significantly higher or lower than the provincial average (***Figure 5-23***).

Further Information

Further information is available on a separate document, the **Appendix**:

Appendix 1: Glossary

Appendix 2: Cancer Definitions

Appendix 3: Data Notes

References

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