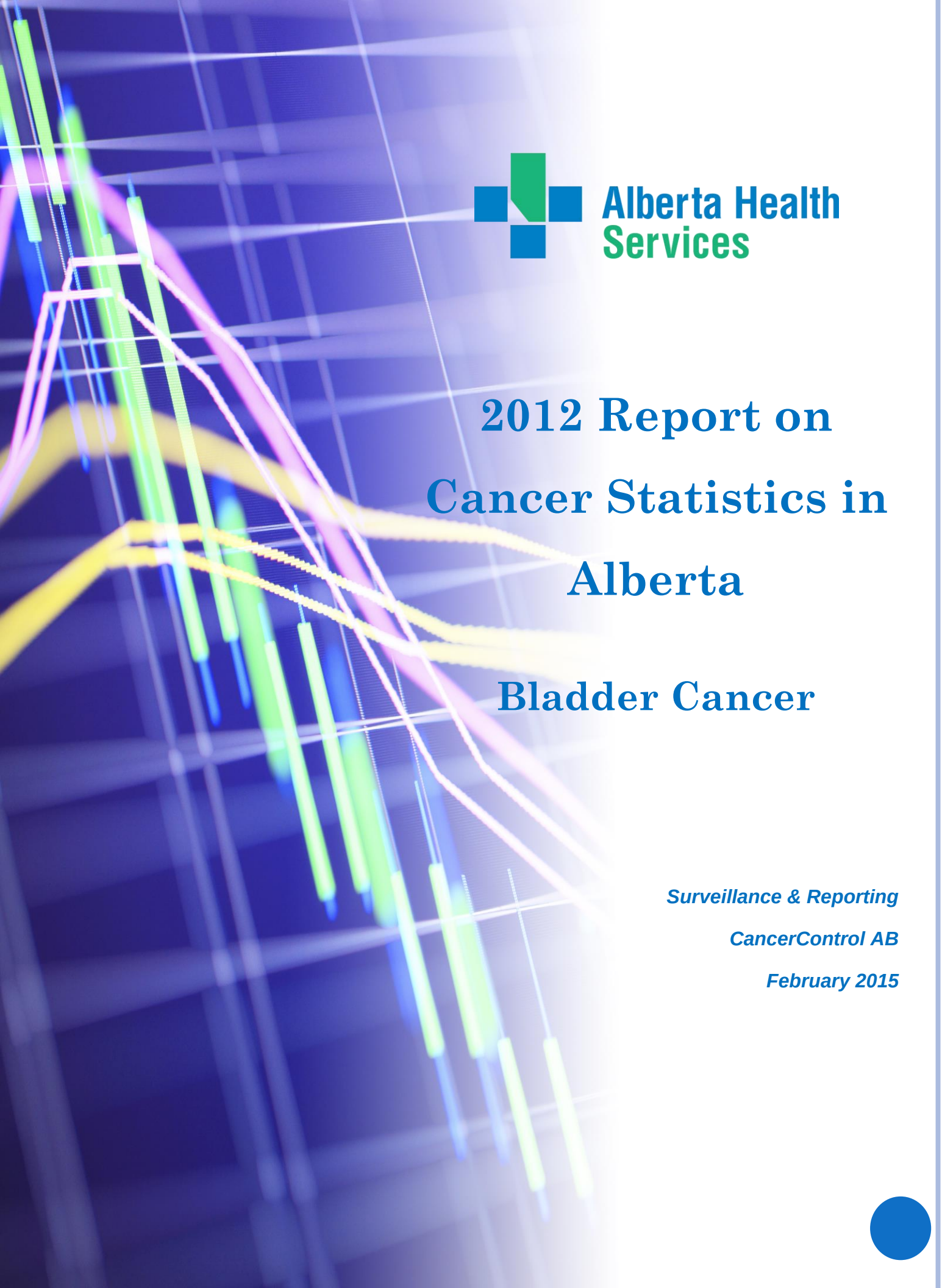


Alberta Health Services

2012 Report on Cancer Statistics in Alberta

Bladder Cancer

Surveillance & Reporting

CancerControl AB

February 2015

Acknowledgements

This report was made possible through Surveillance & Reporting, Cancer Measurement Outcomes Research and Evaluation (C-MORE), CancerControl AB, Alberta Health Services, and the many contributions of individuals across Alberta Health Services as well as external agencies and individuals.

The authors wish to thank individuals working in the following AHS departments and partner agencies for their contributions to this report: Alberta Cancer Registry; Population, Public and Aboriginal Health; Alberta Health and Statistics Canada. Contributions included provision of information, analysis and interpretation, and assistance with consultation sessions and communication of the report.

- *Report Editor:*
  Dr. Lorraine Shack, *Director, Surveillance & Reporting*
- *Project Coordinator:*
  Bethany Kaposhi, *Epidemiologist*
- *Analysis and Review:*
  Dr. Zhenguo Qiu, *Biostatistician*
  Li Huang, *Senior Surveillance Analyst*
  Jingyu Bu, *Senior Surveillance Analyst*
  Anthony Karosas, *Surveillance Analyst*
  Andrew Min, *Assistant Programmer Analyst*
  Lee-Anne Weeks, *Analyst*
  Michael Taylor, *Senior Analyst*
  Shuang Lu, *Senior Surveillance Analyst*
  Ting Liu, *Programmer*
- *Design Assistance:*
  Kira Kulicki, *Communications Coordinator, Alberta Cancer Clinical Trials*

Suggested Citation:

Surveillance & Reporting: *2012 Report on Cancer Statistics in Alberta.* Edmonton: CancerControl AB, Alberta Health Services, 2015.

For More Information:

Visit our website: http://www.albertahealthservices.ca/1703.asp

Table of Contents

Purpose of the Report

Surveillance & Reporting, a specialized team within Cancer Measurement Outcomes Research and Evaluation (C-MORE), Alberta Health Services, actively contributes to Changing our Future: Alberta's Cancer Plan to 2030. As well, Surveillance & Reporting keenly contributes to the goal of making Alberta a place where most cancers are prevented, more cancers are cured, and suffering is reduced. This is accomplished in part 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 bladder cancer (see **Appendix** for cancer site definitions) 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 14, 2014.

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

Summary

- Bladder cancer (including both invasive and in situ) is more commonly diagnosed in males than females. **1 in 23** men and **1 in 81** women will be diagnosed with bladder cancer* within their lifetime. In 2012, there were **738** new cases of bladder cancer in Alberta accounting for **5%** of the cancers diagnosed in Alberta. There were **170** deaths accounting for **3%** of the cancer deaths in Alberta.

- The five-year relative survival ratio for bladder cancer in Alberta is approximately **77%** for those diagnosed between 2010 and 2012. This means that those diagnosed in 2010 to 2012 are about 77% as likely to be alive 5 years after their diagnoses as someone of the same age who has not been diagnosed with cancer. As of December 31, 2012, approximately **6,700** Albertans were alive who had previously been diagnosed with bladder cancer.

- Between 1992 and 2012[†], **both male and female** bladder cancer **incidence and mortality rates have remained stable**. Age-specific rates remain stable until about age 40, at which point rates begin to increase, with rates for males rising more quickly than for females. Looking into the future it is estimated that approximately **910** cases of bladder cancer are expected to be diagnosed in 2017.

- Potential years of life lost (PYLL) is the number of years of life lost when a person dies prematurely from any cause, based on their life expectancy. In 2012, **2,088** potential years of life were lost due to bladder cancer.

* Including both invasive and in situ cases

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

Probability of Developing or Dying from Bladder 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 upon the person being bladder cancer-free prior to the beginning of that age range.

It is important to note that the probabilities of developing or 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 and exposures of the individual. In addition, someone diagnosed with cancer has a higher probability of developing another cancer in the future[1].

Table 7-1: Probability of Developing Bladder Cancer by Age and Sex, Alberta, 2008-2012

Age Group	Males	Females
Lifetime Risk (all ages)	1 in 23	1 in 81
0 - 20	Less than 1 in 10,000	Less than 1 in 100,000
20 - 30	Less than 1 in 10,000	Less than 1 in 1,000,000
30 - 40	1 in 5,897	Less than 1 in 10,000
40 - 50	1 in 1,220	1 in 3,657
50 - 60	1 in 324	1 in 895
60 - 70	1 in 106	1 in 377
70 - 80	1 in 55	1 in 225
80+	1 in 34	1 in 150

Data Source: Alberta Cancer Registry, Alberta Health Services

The probability of developing bladder cancer varies with age and sex (**Table 7-1**). Approximately 1 in 23 males and 1 in 81 females will develop bladder cancer in their lifetime.

On a population basis, the probability of developing bladder cancer by the end of the age range for a bladder cancer-free individual at the beginning of the age range are shown in **Table 7-1**. For instance, a bladder cancer-free female at age 50 has a 1 in 895 chance of developing bladder cancer by the time she is 60.

Table 7-2: Probability of Dying from Bladder Cancer by Age and Sex, Alberta, 2008-2012

Age Group	Males	Females
Lifetime Risk (all ages)	1 in 89	1 in 296
0 - 20	Less than 1 in 10,000	Less than 1 in 10,000
20 - 30	Less than 1 in 100,000	Less than 1 in 1,000,000
30 - 40	Less than 1 in 100,000	Less than 1 in 100,000
40 - 50	Less than 1 in 10,000	Less than 1 in 10,000
50 - 60	1 in 2,545	1 in 8,476
60 - 70	1 in 744	1 in 2,439
70 - 80	1 in 261	1 in 906
80+	1 in 86	1 in 367

Data Source: Alberta Cancer Registry, Alberta Health Services

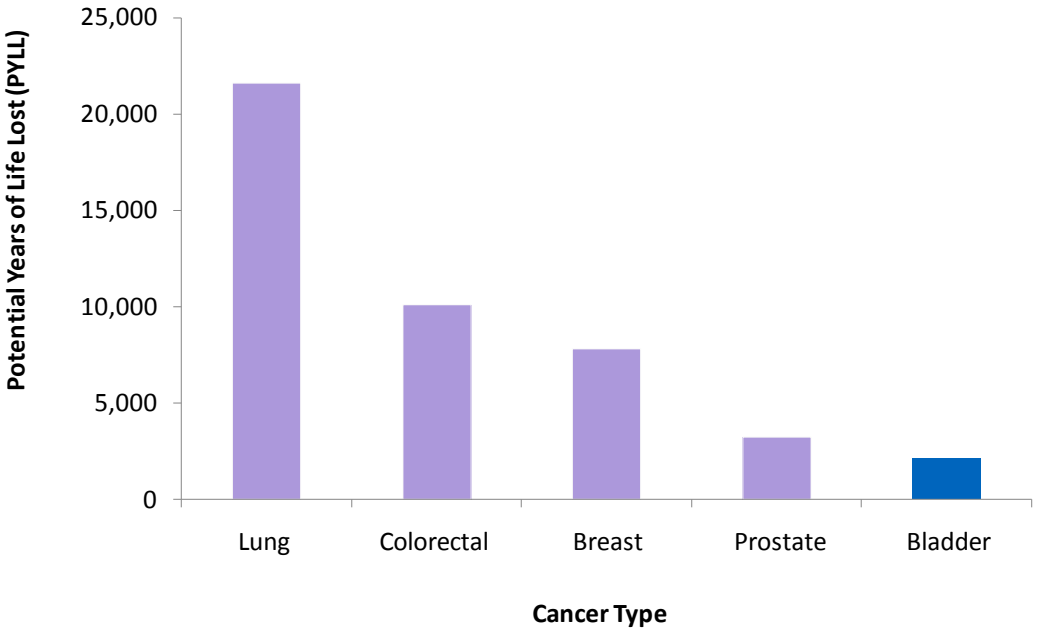
The probability of dying from bladder cancer varies by age and sex (**Table 7-2**). Approximately 1 in 89 males and 1 in 296 females will die of bladder cancer.

On a population basis, the probability of a cancer-free individual at the beginning of the age range dying from bladder cancer by the end of the age range are shown in **Table 7-2**. For example, a cancer-free female at age 50 has a 1 in 8,476 chance of dying from bladder cancer by the time she is 60.

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.

Figure 7-1: Potential Years of Life Lost (PYLL) from Bladder Cancer† Compared with Lung†, Colorectal†, Breast‡ and Prostate Cancers, Alberta, 2012



† Male and Female
‡ Female only

Data Source: Alberta Cancer Registry, Alberta Health Services

In 2012, **2,088** potential years of life were lost due to bladder cancer, which constitutes 2.3% of PYLL for all cancers (**Figure 7-1**).

Prevalence

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

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

In this section of the report, both limited-duration and complete bladder cancer prevalence are presented; the latter describing the number of people alive as of December 31, 2012 who had ever been diagnosed with bladder 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, which can affect the whole community.

As of December 31, 2012, **6,700** Albertans were alive who had previously been diagnosed with bladder cancer (**Table 7-3**). In addition, there were **1,300** Albertans alive who had been diagnosed with bladder cancer within the previous two years. The two year time period is significant because most definitive cancer treatments will occur within two years of diagnosis.

Table 7-3: Limited-Duration and Complete Prevalence for Bladder Cancer, Both Sexes, Alberta, 2012

Duration	Prevalence (#)
2-Year	1,300
5-Year	2,650
10-Year	4,200
20-Year	5,750
Complete (Ever Diagnosed)	6,700

Data Source: Alberta Cancer Registry, Alberta Health Services

Bladder Cancer Incidence and Mortality

Introduction

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 bladder cancer diagnoses in Alberta residents in a calendar year. Incidence rates are the number of new cancer cases diagnosed per 100,000 in the 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 bladder cancer in Alberta residents in a calendar year, regardless of date of diagnosis. Mortality rates are the number of deaths per 100,000 in the 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. 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 standard population is used.

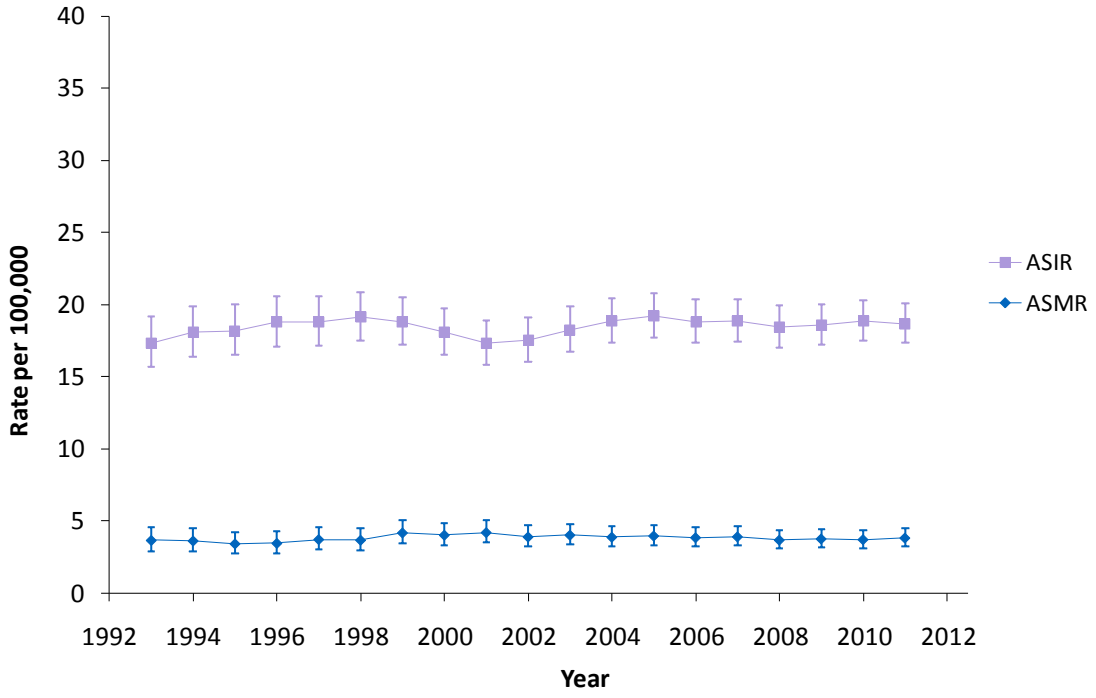
Three-year moving averages are used to smooth out year-to-year fluctuations so that the underlying trend may be more easily observed. They are calculated based on aggregating three years of data. Age-standardized incidence rates (ASIRs) and age-standardized mortality rates (ASMRs) are presented as three-year moving averages; therefore, information can only be presented for 1993-2011. This smoothing of trends is especially important when the number of cancer cases per year is relatively small and where year-to-year variability can be quite large.

Incidence and mortality can be affected by the 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. Incidence and mortality are also affected by the development of cancer treatment programs, which may impact chances of survival and research innovations.

The following figures show incidence and mortality trends 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] 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).

* Throughout this report, the use of the word significant refers to statistical significance at an alpha level of 0.05 (i.e. 95%CI).

Figure 7-2: Age-Standardized Incidence Rates (ASIRs)[*†] and Mortality Rates (ASMRs)[*†] with 95% Confidence Intervals (CI) for Bladder Cancer, Both Sexes, Alberta, 1992-2012



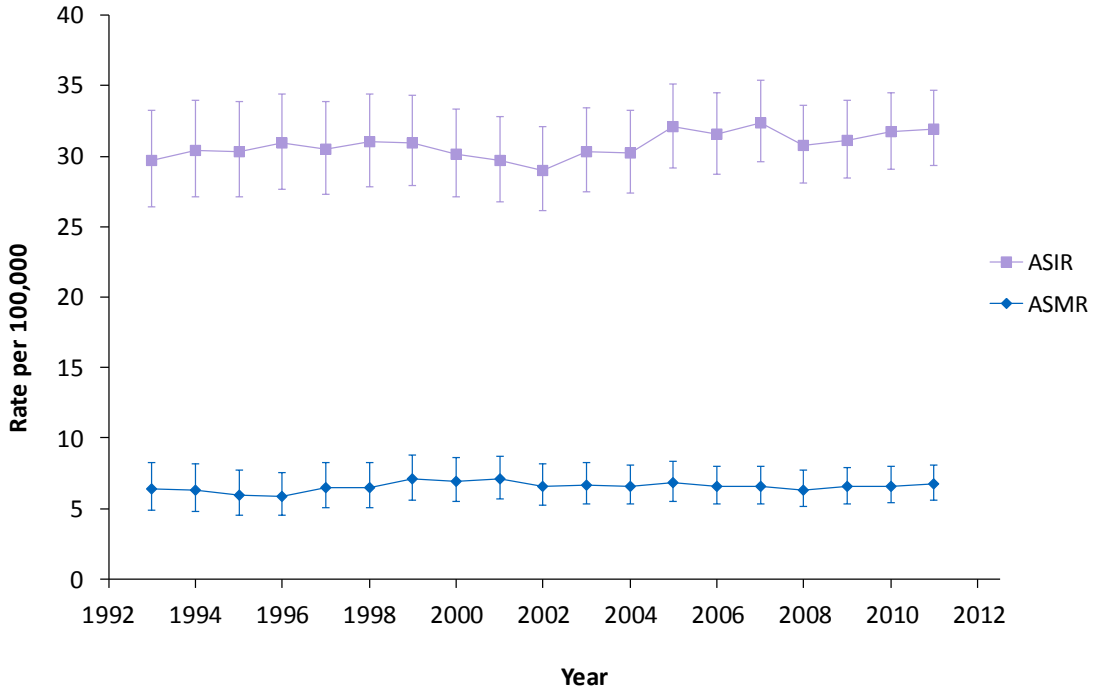
[*] Three-year moving average.
[†] Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health

Bladder cancer ASIRs have not changed significantly since 1992 (**Figure 7-2**). In 2012, the ASIR for bladder cancer in both sexes was 18.0 per 100,000 in the population.

Bladder cancer ASMRs have not changed significantly since 1992 (**Figure 7-2**). In 2012, the ASMR for bladder cancer in both sexes was 4.0 per 100,000 in the population.

Figure 7-3: Age-Standardized Incidence Rates (ASIRs)[*†] and Mortality Rates (ASMRs)[*†] with 95% Confidence Intervals (CI) for Bladder Cancer, Males, Alberta, 1992-2012



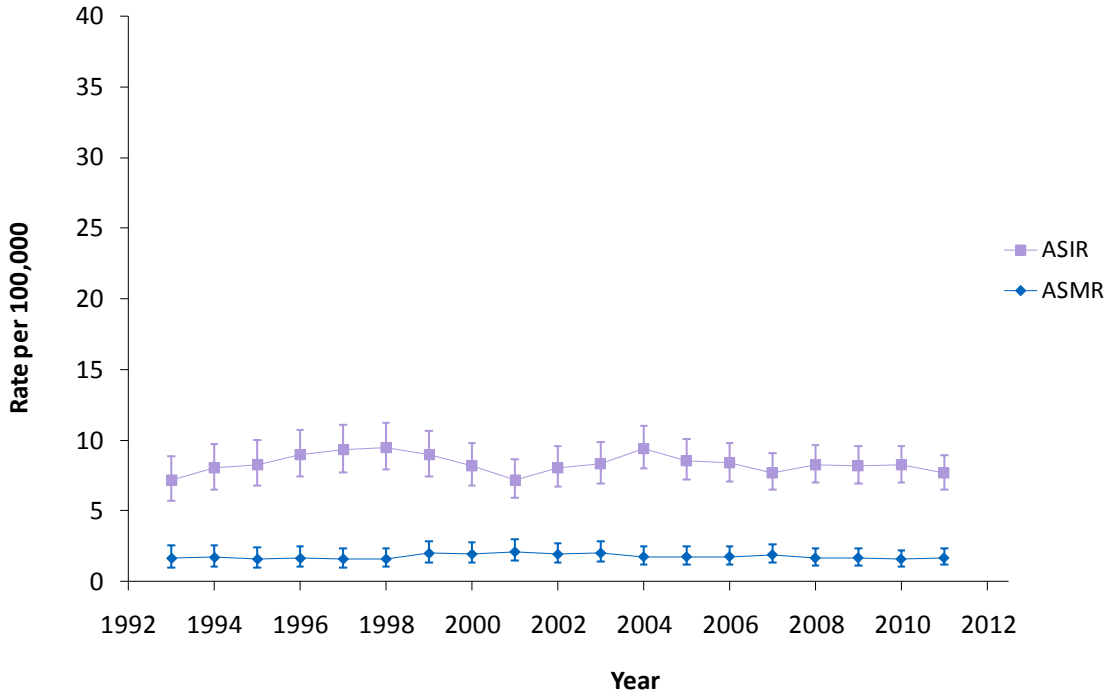
[*] Three-year moving average.
[†] Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health

Male bladder cancer ASIRs have not changed significantly between 1992 and 2012 (**Figure 7-3**). In 2012, the ASIR for bladder cancer in males was 30.2 per 100,000 males in the population.

Male bladder cancer ASMRs have not changed significantly between 1992 and 2012 (**Figure 7-3)**. In 2012, the ASMR for bladder cancer in males was 7.0 per 100,000 males in the population.

Figure 7-4: Age-Standardized Incidence Rates (ASIRs)[*†] and Mortality Rates (ASMRs)[*†] with 95% Confidence Intervals (CI) for Bladder Cancer, Females, Alberta, 1992-2012



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

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health

Female bladder cancer ASIRs have not changed significantly between 1992 and 2012 (**Figure 7-4**). In 2012, the ASIR for bladder cancer in females was 7.5 per 100,000 females in the population.

Female bladder cancer ASMRs have not changed significantly between 1992 and 2012 (**Figure 7-4)**. In 2012, the ASMR for bladder cancer in females was 1.8 per 100,000 females in the population.

Bladder Cancer Incidence

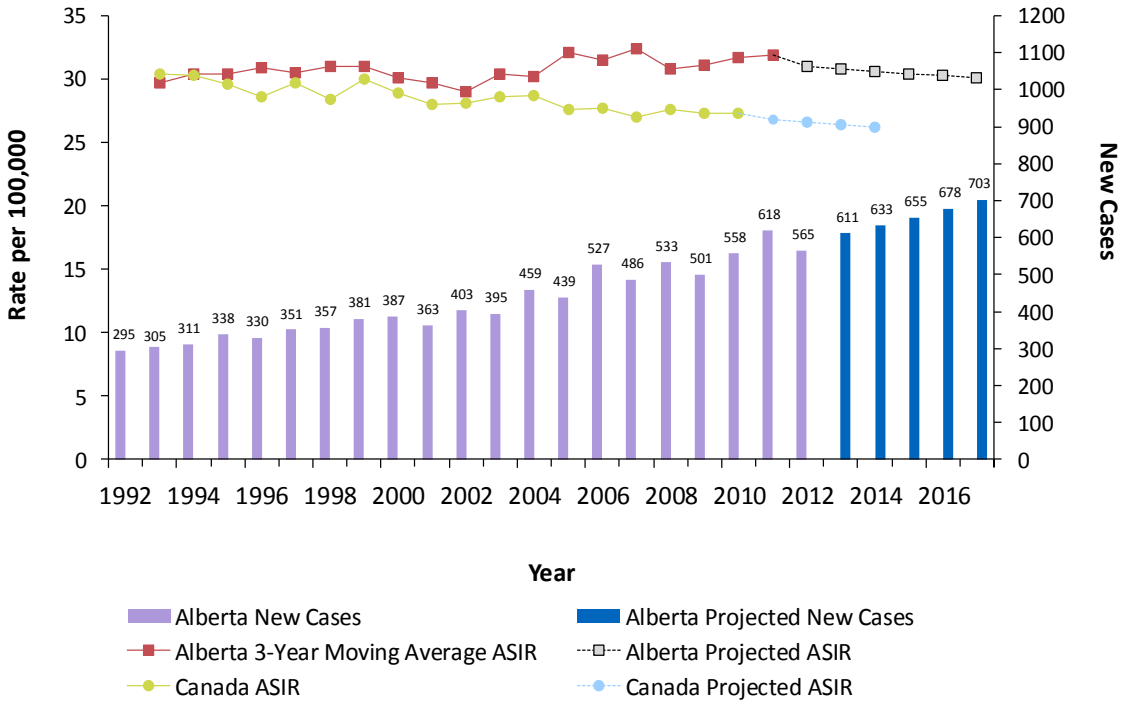
The following three figures (**Figures 7-5** to **7-7**) provide information on bladder cancer incidence in Alberta. The number of new cancer cases in Alberta is affected not only by changes in the underlying risk of developing bladder cancer, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized incidence rates (ASIRs) are provided. Furthermore, because coding for bladder cancer has changed over the study time period, we included both invasive and *in situ* bladder cancer cases in the analysis.

In **Figures 7-5** and **7-6** observed age standardized incidence rates are shown from 1992 to 2011 (three-year moving averages), ***projected*** rates from 2012 to 2017, and observed numbers of new bladder cancer cases are shown for the years 1992 to 2012 and projected numbers for 2013 to 2017.

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 2011 (due to the use of three-year moving averages) and estimated for 2012 to 2017. 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 bladder cancer incidence rates were calculated by extrapolating the historical trends in age-specific rate based on data from 1987 to 2011.

Figure 7-5: Actual and Projected Number of New Cases and Age-Standardized Incidence Rates (ASIRs)*† for Bladder Cancer, Males, Alberta, 1992-2017



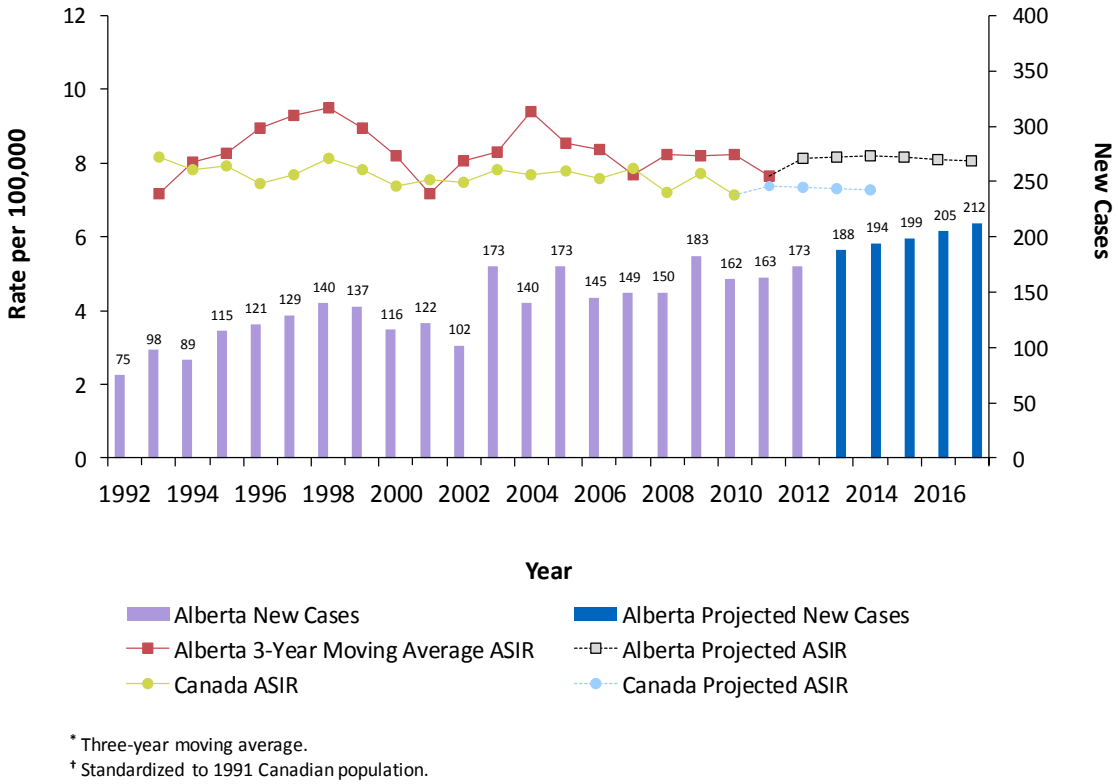
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health; Canadian Cancer Society

In 2012, 565 cases of male bladder cancer were diagnosed in Alberta (**Figure 7-5**). Overall, ASIRs for male bladder cancer in Alberta were higher than ASIRs in Canada.

It is estimated that 700 cases of bladder cancer will be diagnosed in males in Alberta in 2017.

Figure 7-6: Actual and Projected Number of New Cases and Age-Standardized Incidence Rates (ASIRs)*† for Bladder Cancer, Females, Alberta, 1992-2017



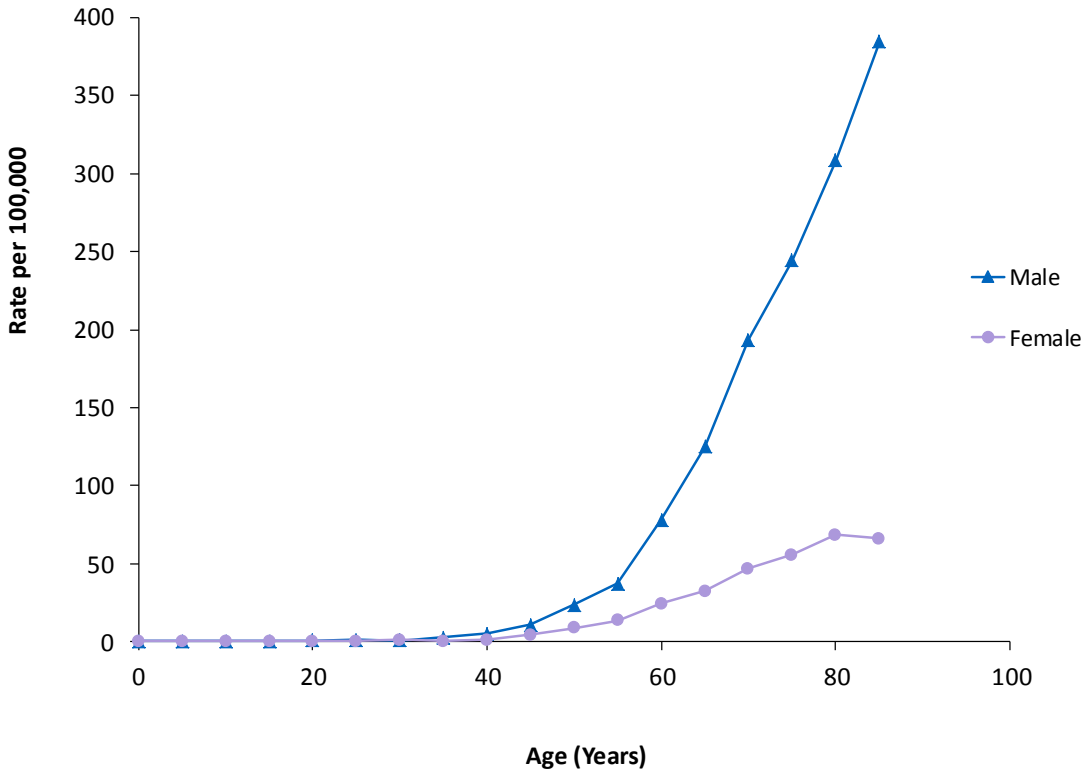
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health; Canadian Cancer Society

In 2012, 173 cases of female bladder cancer were diagnosed in Alberta (**Figure 7-6**). Overall, ASIRs for female bladder cancer in Alberta were generally higher than ASIRs in Canada.

It is estimated that 210 cases of bladder cancer will be diagnosed in females in Alberta in 2017.

Figure 7-7: Age-Specific Incidence Rates for Bladder Cancer by Sex, Alberta, 2008-2012



Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health

Incidence rates of bladder cancer are similar for both males and females until about age 40 (**Figure 7-7**). After age 40, male rates rise much faster and further than female rates with the older age groups in both sexes having the highest rates of bladder cancer.

Bladder Cancer Mortality

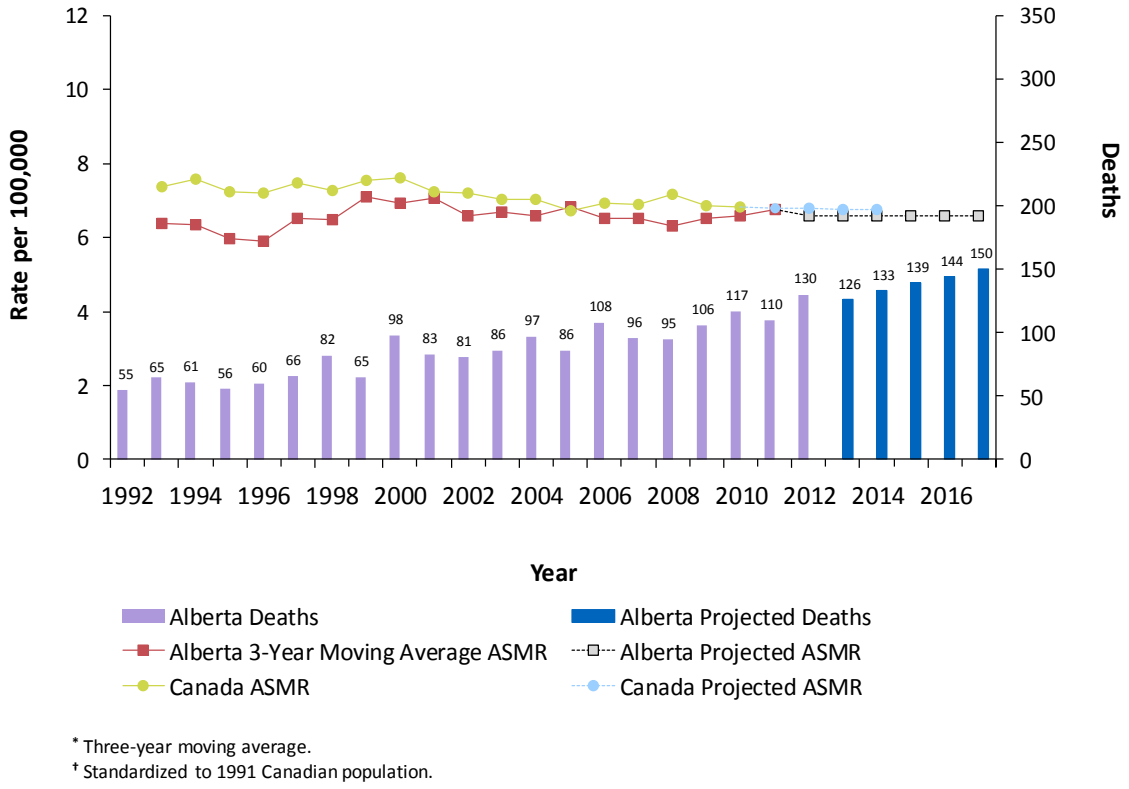
The following three figures (**Figures 7-8** to **7-10**) provide information on bladder cancer mortality in Alberta. The number of deaths in Alberta is affected not only by changes in the underlying risk of dying from bladder cancer, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized mortality rates (ASMRs) are also provided.

In **Figures 7-8** and **7-9** observed age standardized mortality rates are shown for 1992 to 2011 (three-year moving averages), ***projected*** rates for 2012 to 2017. Similarly, observed numbers of bladder cancer deaths are shown for the years 1992 to 2012 and projected numbers for 2013 to 2017.

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 2011 (due to the use of three-year moving averages) and estimated for 2012 to 2017. 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 bladder cancer mortality rates were calculated by extrapolating the historical trends in age-specific rate based on data from 1987 to 2011.

Figure 7-8: Actual and Projected Number of Deaths and Age-Standardized Mortality Rates (ASMRs)*† for Bladder Cancer, Males, Alberta, 1992-2017



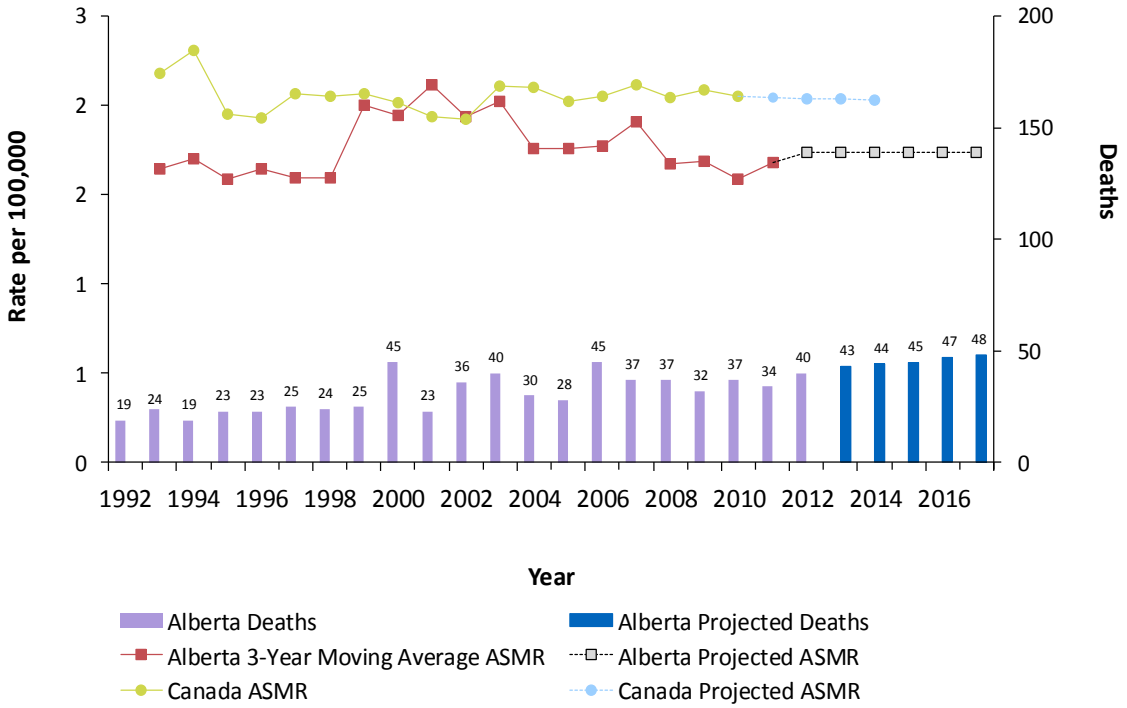
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health; Canadian Cancer Society

In 2012, 130 males died from bladder cancer in Alberta (**Figure 7-8**). ASMRs for male bladder cancer in Alberta were general lower than rates in Canada.

It is estimated that 150 males will die from bladder cancer in Alberta in 2017.

Figure 7-9: Actual and Projected Number of Deaths and Age-Standardized Mortality Rates (ASMRs)*† for Bladder Cancer, Females, Alberta, 1992-2017



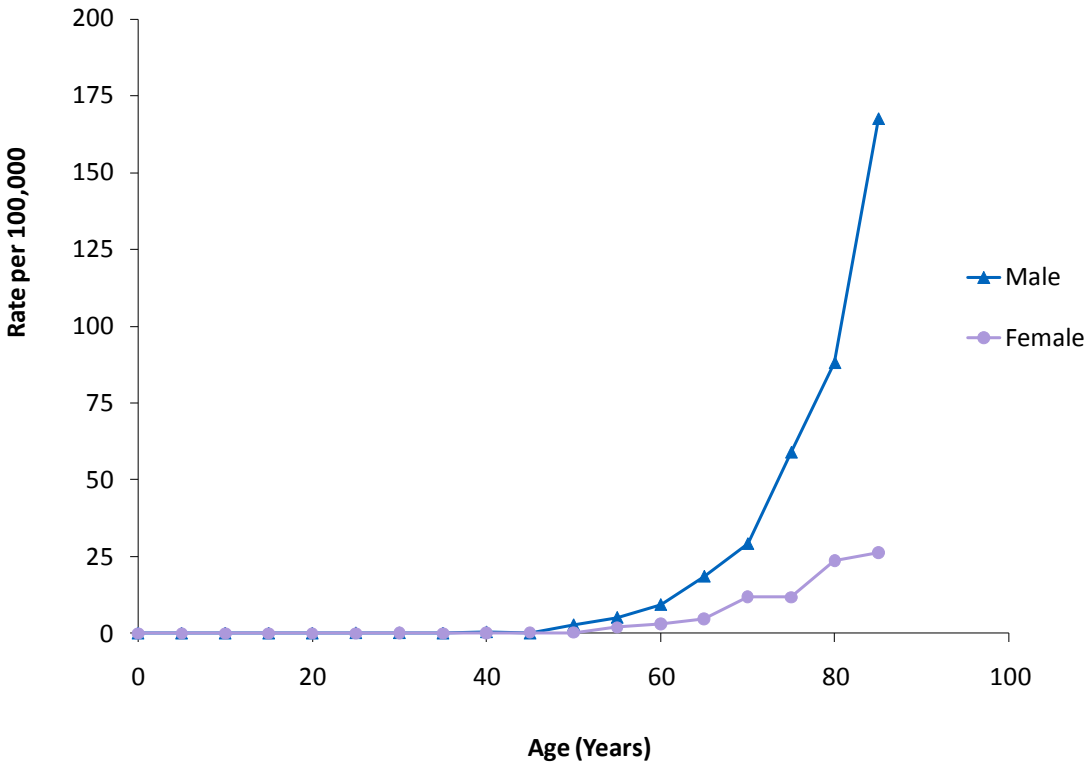
* Three-year moving average.
† Standardized to 1991 Canadian population.

Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health; Canadian Cancer Society

In 2012, 40 females died from bladder cancer in Alberta (**Figure 7-9**). ASMRs for female bladder cancer in Alberta were generally lower than ASMRs in Canada.

It is estimated that 50 females will die from bladder cancer in Alberta in 2017.

Figure 7-10: Age-Specific Mortality Rates for Bladder Cancer by Sex, Alberta, 2008-2012



Data Source: Alberta Cancer Registry, Alberta Health Services; Alberta Health

Age-specific mortality rates for both sexes increase after approximately age 45 (**Figure 7-10**). Male and female bladder cancer mortality rates are similar until age 50, with female rates being lower than male rates after age 50. The highest bladder cancer mortality rates occur in the older age groups.

Bladder 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.

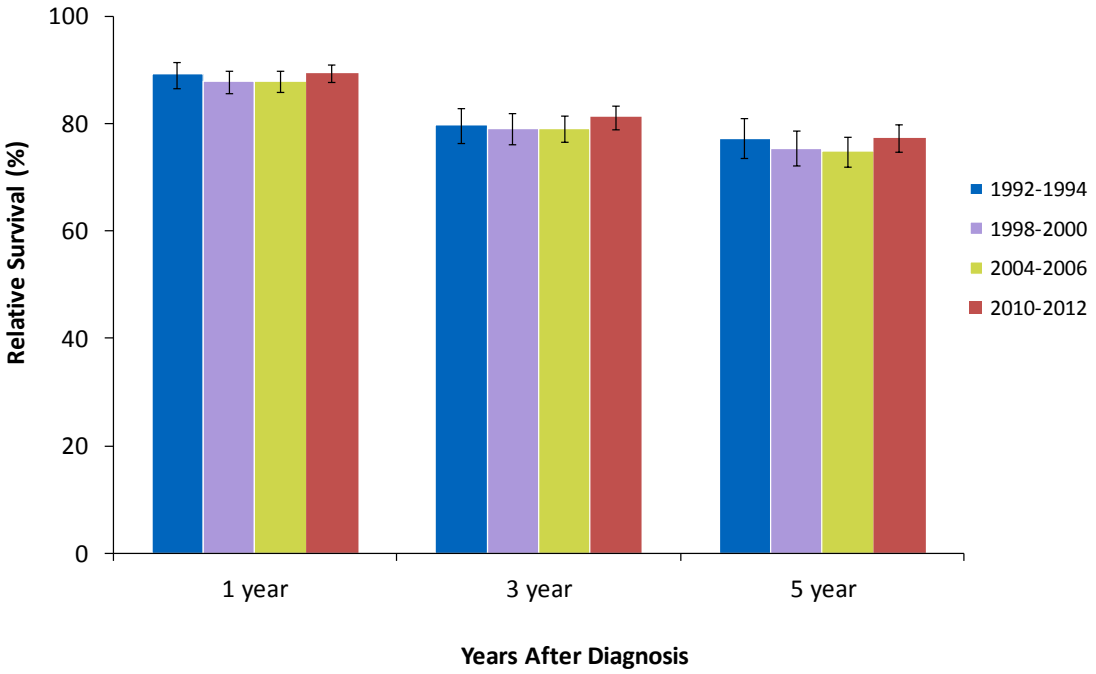
Survival depends on several factors including the cancer type (most importantly site, stage, and morphology at diagnosis), sex, age at diagnosis, health status, and available treatments for that cancer. While ***relative survival ratios*** (RSRs) give a general expectation of survival over the whole 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.[6] In this section of the report, RSRs are standardized by the age structure in the standard 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 the 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 7-11: Crude One, Three and Five-Year Relative Survival Ratios with 95% Confidence Intervals (CI) for Bladder Cancer, Both Sexes, Alberta, 1992-1994^, 1998-2000^ and 2004-2006^, 2010-2012*†



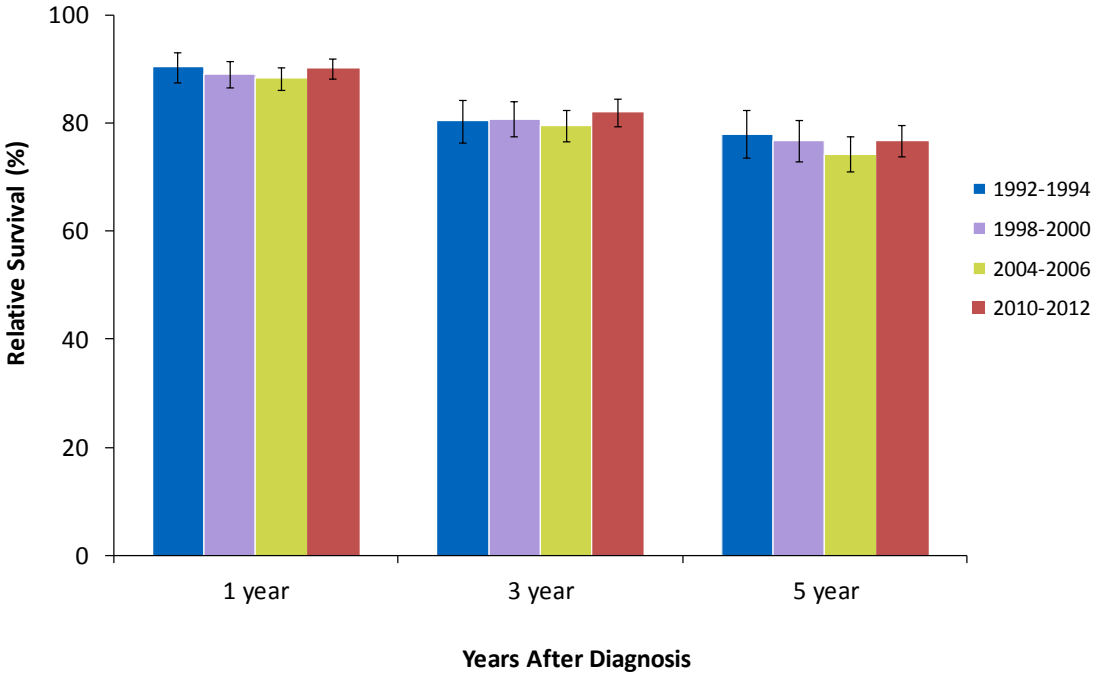
^ Ratios calculated by cohort method, where complete follow-up data are available.
†* Ratios calculated by period method, where complete follow-up data are not available.

Data Source: Alberta Cancer Registry, Alberta Health Services; Statistics Canada

The five-year relative survival ratio for individuals diagnosed with bladder cancer in the period of 2010-2012 is estimated to be 77%.

The five-year relative survival ratio for individuals diagnosed with bladder cancer in Alberta has not changed from 2010-2012 compared to those diagnosed in the 1992-1994 cohort years (**Figure 7-11**).

Figure 7-12: Crude One, Three and Five-Year Relative Survival Ratios with 95% Confidence Intervals (CI) for Bladder Cancer, Males, Alberta, 1992-1994^, 1998-2000^ and 2004-2006^, 2010-2012*†



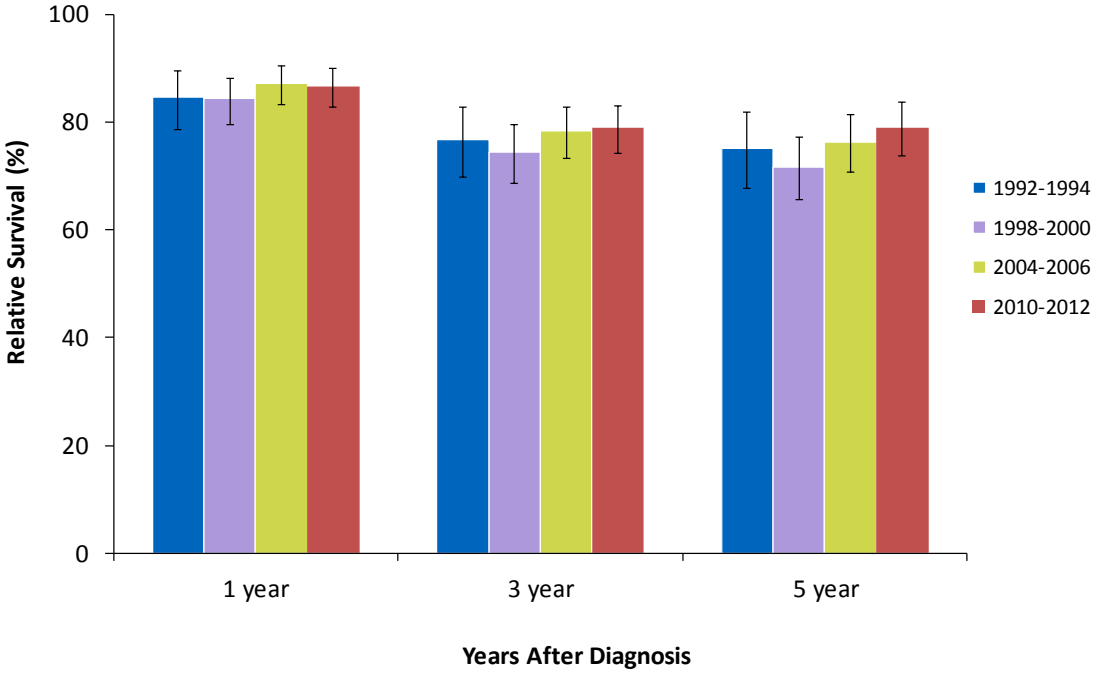
^ Ratios calculated by cohort method, where complete follow-up data are available.
†* Ratios calculated by period method, where complete follow-up data are not available.

Data Source: Alberta Cancer Registry, Alberta Health Services; Statistics Canada

The five-year relative survival ratio for males diagnosed with bladder cancer in the period of 2010 to 2012 is estimated to be 77%.

The five-year relative survival ratio for males diagnosed with bladder cancer in Alberta has not changed from 2010-2012 compared to those diagnosed in the 1992-1994 cohort years (**Figure 7-12**).

Figure 7-13: Crude One, Three and Five-Year Relative Survival Ratios with 95% Confidence Intervals (CI) for Bladder Cancer, Females, Alberta, 1992-1994^, 1998-2000^ and 2004-2006^, 2010-2012*



^ 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 Source: Alberta Cancer Registry, Alberta Health Services; Statistics Canada

The five-year relative survival ratio for females diagnosed with bladder cancer in the period of 2010 to 2012 is estimated to be 79%.

The five-year relative survival ratio for females diagnosed with bladder cancer in Alberta has not changed from 2010-2012 compared to those diagnosed in the 1992-1994 cohort years (**Figure 7-13**).

Further Information

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

Appendix 1: Glossary of Terms
Appendix 2: Cancer Definitions
Appendix 3: Data Notes

References

1. Okamoto N, Morio S, Inoue R and Akiyama K. The risk of a second primary cancer occurring in five-year survivors of an initial cancer. Jpn. J Clin Oncol, 1987; 17(3):205-213.

2. National Cancer Institute - Surveillance Epidemiology and End Results [Internet]. USA. National Institutes of Health; Cancer Prevalence Statistics Overview; 2014 Apr 10 [cited 2014 Nov 6]; Available from: http://surveillance.cancer.gov/prevalence/]

3. Kim H-J, Fay M and Feuer E. Permutation tests for JoinPoint regression with applications to cancer rates. Stat Med, 2000; 19:335-351.

4. 2012 Alberta Population Data [Excel Spreadsheet]. Edmonton (Alberta): Alberta Health; 2014.

5. Canadian Cancer Society's Steering Committee: Canadian Cancer Statistics 2014. Toronto: Canadian Cancer Society, 2014.

6. Ederer F, Axtell LM and Cutler SJ. The relative survival rate: a statistical methodology. Natl Cancer Inst Monogr, 1961; 6: 101-121.

7. Brennera H, Gefellerb O and Hakulinen T. Period analysis for 'up-to-date' cancer survival data: theory, empirical evaluation, computational realisation and applications. European Journal of Cancer, 2004; 40: 326-335.

Contact Information

If further information is required, please contact Surveillance & Reporting, C-MORE, Alberta Health Services as follows:

Mailing Address:
Alberta Health Services
Surveillance & Reporting
C-MORE
1400 - 10123-99 Street
Edmonton, AB, Canada
T5J 3H1

Phone: 780-643-4347
Fax: 780-643-4380
Email: ACB.cancerdata@albertahealthservices.ca