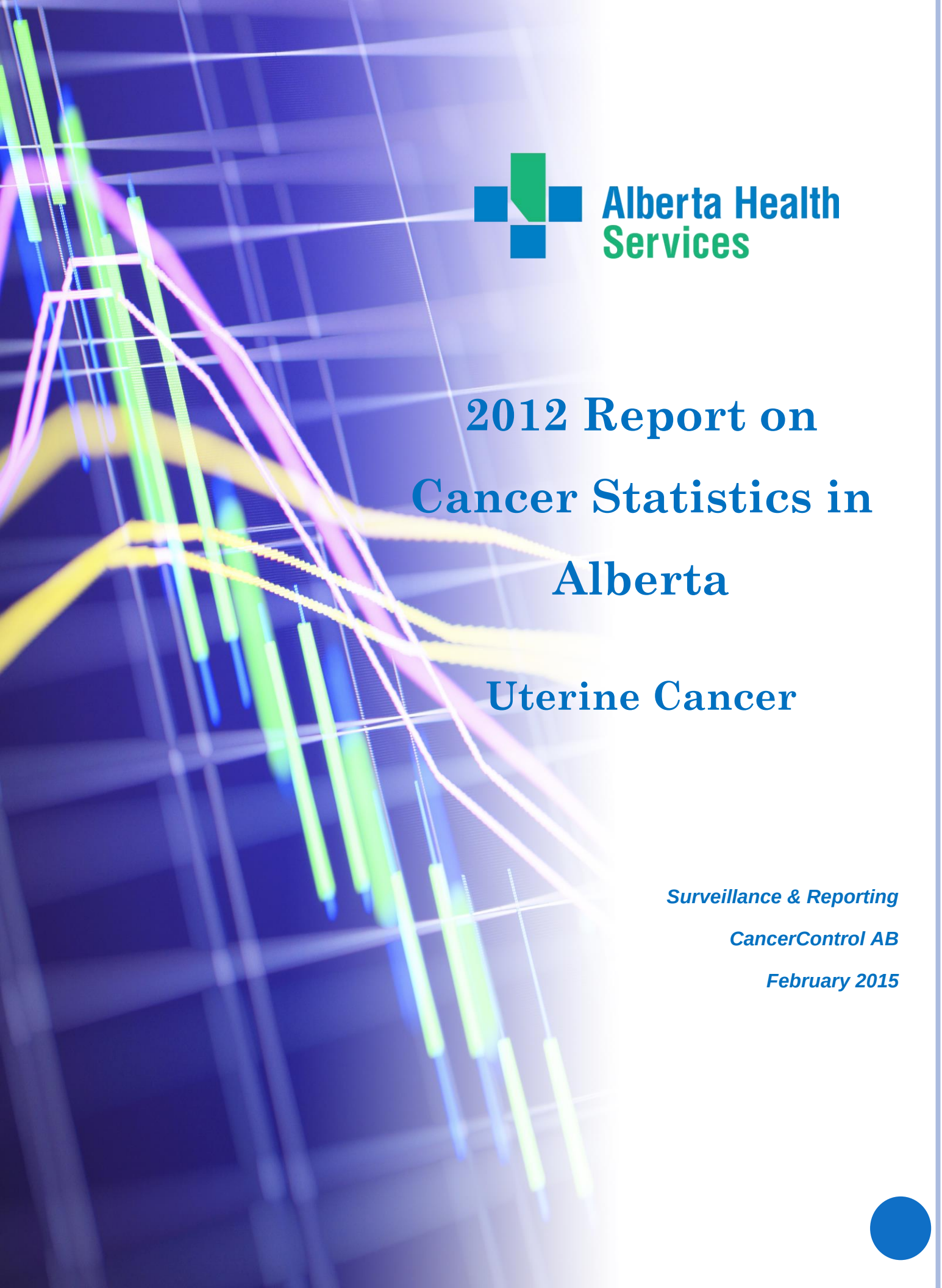

Alberta Health Services

2012 Report on Cancer Statistics in Alberta

Uterine Cancer

Surveillance & Reporting

CancerControl AB

February 2015

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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 uterine 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

- Uterine cancer accounts for **7%** of all cancers diagnosed in women. Approximately **1 in 33** women will be diagnosed with uterine cancer within their lifetime. As of December 31, 2012, approximately **6,350** Albertan women were alive with a prior diagnosis of uterine cancer.

- In 2012, there were **529** new cases of uterine cancer in Alberta and **87** deaths due to the disease. Over the last 30 years, from 1992 to 2012*, uterine cancer **incidence rates have increased** while mortality rates have remained stable. Uterine cancer incidence begins rising at age 30, peaking at age 65, and then declining in older ages. In 2017 it is estimated that approximately **600** cases of uterine cancer are expected to be diagnosed.

- Survival for uterine cancer has been stable over the last 20 years. The five-year relative survival ratio for uterine cancer in Alberta is approximately **83%** for those diagnosed between 2010 and 2012. This means that those diagnosed in 2010 to 2012 are about 83% as likely to be alive 5 years after their diagnoses as women of the same age who have not been diagnosed with cancer.

- 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, **1,641** potential years of life were lost due to uterine cancer.

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

Probability of Developing or Dying from Uterine 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 uterine 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 11-1: Probability of Developing Uterine Cancer by Age, Alberta, 2008-2012

Age Group	Females
Lifetime Risk (all ages)	1 in 33
0 - 20	Less than 1 in 10,000
20 - 30	Less than 1 in 10,000
30 - 40	1 in 1,860
40 - 50	1 in 544
50 - 60	1 in 155
60 - 70	1 in 92
70 - 80	1 in 120
80+	1 in 142

Data Source: Alberta Cancer Registry, Alberta Health Services

The probability of developing uterine cancer varies with age (**Table 11-1**). Approximately 1 in 33 females will develop invasive uterine cancer in their lifetime.

On a population basis, the probability of developing uterine cancer by the end of the age range for a uterine cancer-free individual at the beginning of the age range are shown in **Table 11-1**. For instance, a uterine cancer-free female at age 40 has a 1 in 544 chance of developing uterine cancer by the time she is 50. Females in the 60-70 age range are most likely to be diagnosed with uterine cancer.

Table 11-2: Probability of Dying from Uterine Cancer by Age, Alberta, 2008-2012

Age Group	Females
Lifetime Risk (all ages)	1 in 179
0 - 20	Less than 1 in 10,000
20 - 30	Less than 1 in 10,000
30 - 40	Less than 1 in 10,000
40 - 50	1 in 6,422
50 - 60	1 in 1,681
60 - 70	1 in 813
70 - 80	1 in 618
80+	1 in 308

Data Source: Alberta Cancer Registry, Alberta Health Services

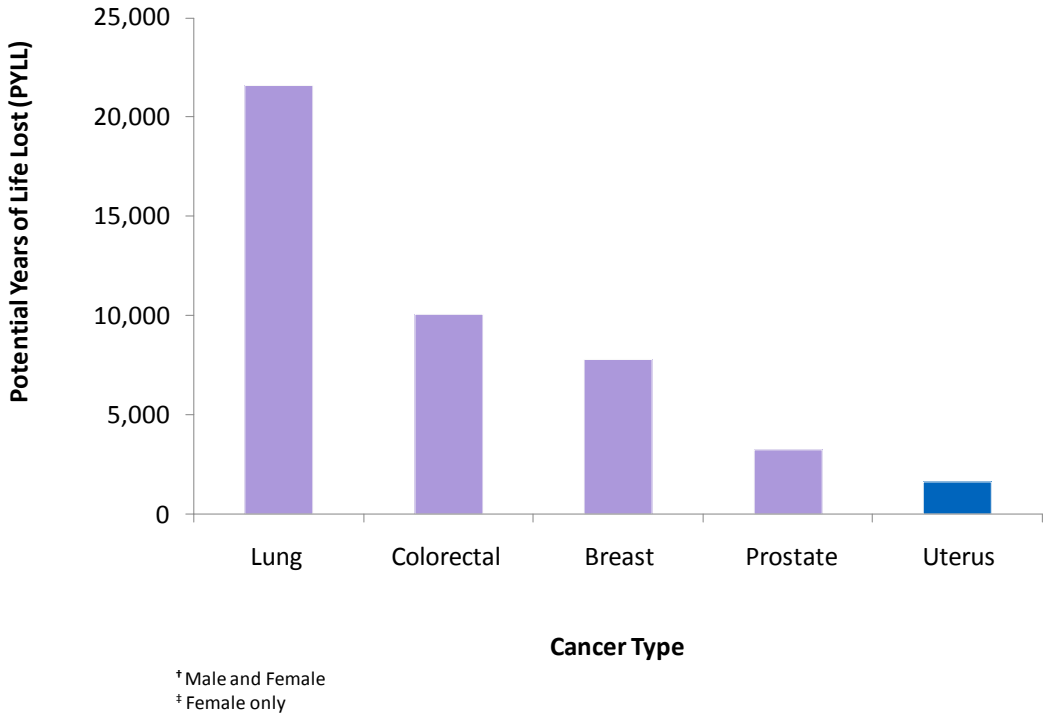
The probability of dying from uterine cancer in females varies by age (**Table 11-2**). Approximately 1 in 179 females will die of invasive uterine cancer.

On a population basis, the probability of a cancer-free individual at the beginning of the age range dying from uterine cancer by the end of the age range are shown in **Table 11-2**. For example, a cancer-free female at age 40 has a 1 in 6,422 chance of dying from uterine cancer by the time she is 50.

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 11-1: Potential Years of Life Lost (PYLL) from Uterine Cancer‡ Compared with Lung†, Colorectal†, Breast‡ and Prostate Cancers, Alberta, 2012



† Male and Female
‡ Female only

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

In 2012, **1,641** potential years of life were lost due to uterine cancer, which constitutes 1.8% of PYLL for all cancers (**Figure 11-1**).

Prevalence

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

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

In this section of the report, both limited-duration and complete uterine cancer prevalence are presented; the latter describing the number of people alive as of December 31, 2012 who had ever been diagnosed with uterine 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, approximately **6,350** Albertans were alive who had previously been diagnosed with uterine cancer (**Table 11-3**). In addition, there were **1,000** Albertans alive who had been diagnosed with uterine 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 11-3: Limited-Duration and Complete Prevalence for Uterine Cancer, Alberta, 2012

Duration	Prevalence (#)
2-Year	1,000
5-Year	2,050
10-Year	3,450
20-Year	5,100
Complete (Ever Diagnosed)	6,350

Data Source: Alberta Cancer Registry, Alberta Health Services

Uterine 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 uterine 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 uterine 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.

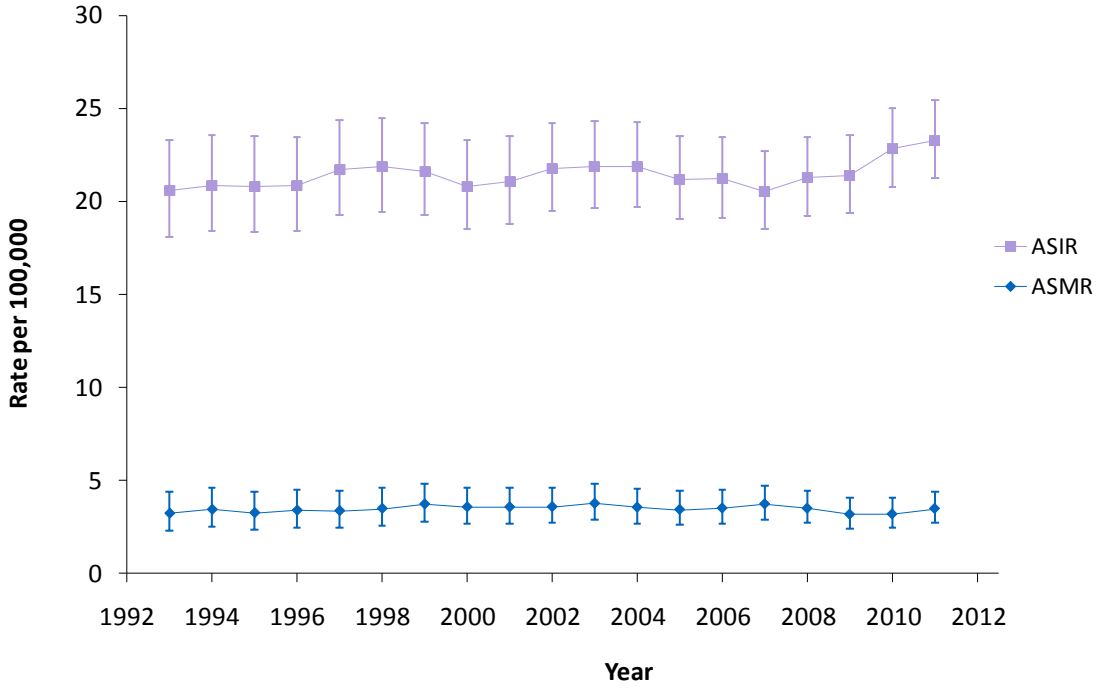
Three-year moving averages are used to smooth out year-to-year fluctuations so that the underlying trend may be more easily observed. They are calculated based on aggregating three years of data. Age-standardized incidence rates (ASIRs) and age-standardized mortality rates (ASMRs) are presented as three-year 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 11-2: Age-Standardized Incidence Rates (ASIRs)[*†] and Mortality Rates (ASMRs)[*†] with 95% Confidence Intervals (CI) for Uterine Cancer, Alberta, 1992-2012



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

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

Uterine cancer ASIRs increased significantly between 1992 and 2012 (**Figure 11-2**) by 0.5% annually. In 2012, the ASIR for female uterine cancer was 23.9 per 100,000 females in the population.

Uterine cancer mortality rates are lower than incidence rates (**Figure 11-2**). Female uterine cancer ASMRs did not change significantly between 1992 and 2012. In 2012, the ASMR for female uterine cancer was 3.9 per 100,000 females in the population.

Uterine Cancer Incidence

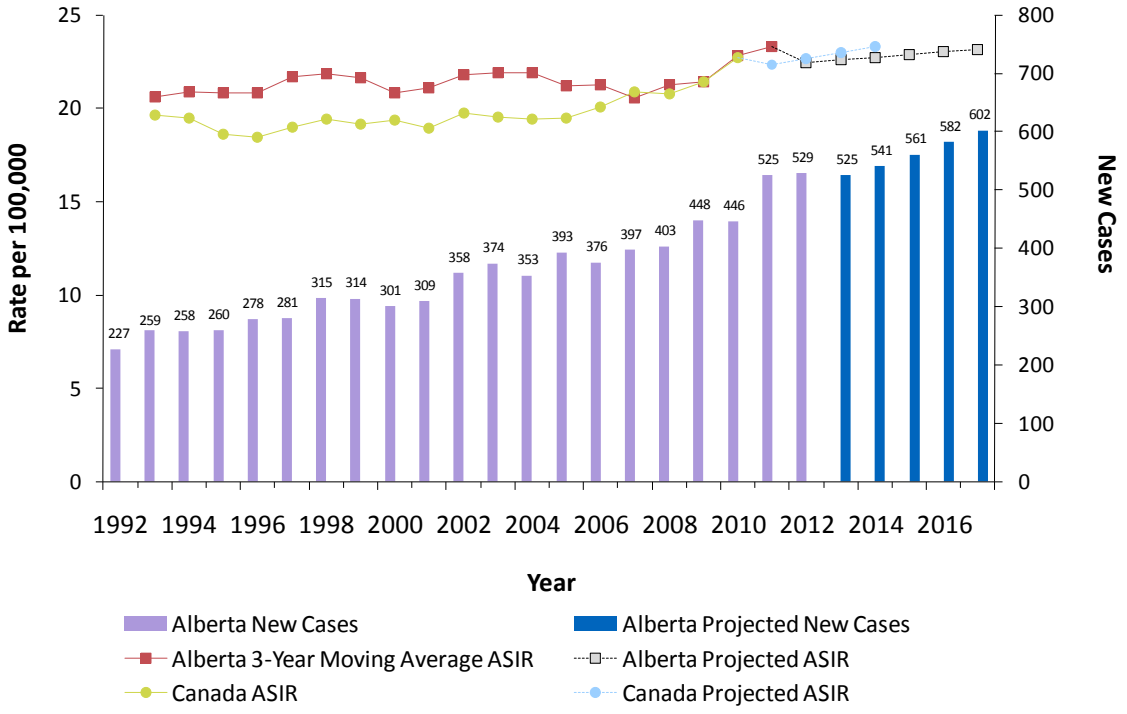
The following two figures (**Figures 11-3** to **11-4**) provide information on uterine cancer incidence in Alberta. The number of new cancer cases in Alberta is affected not only by changes in the underlying risk of developing uterine cancer, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized incidence rates (ASIRs) are provided.

In **Figure 11-3** observed age standardized incidence rates are shown for 1992 to 2011 (three-year moving averages), ***projected*** rates for 2012 to 2017, and observed numbers of new uterine 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 uterine cancer incidence rates were calculated by extrapolating the historical trends in age-specific rate based on data from 1987 to 2011.

Figure 11-3: Actual and Projected Number of New Cases and Age-Standardized Incidence Rates (ASIRs)*† for Uterine Cancer, Alberta, 1992-2017



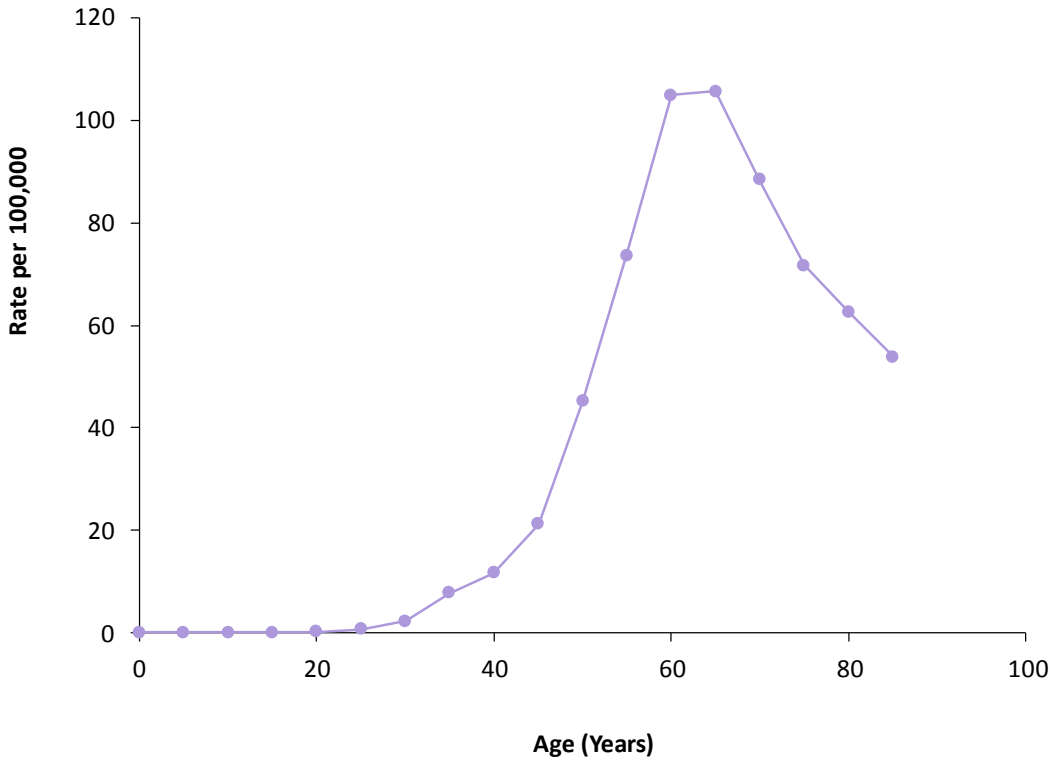
* Three-year moving average.
† Standardized to 1991 Canadian population.

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

In 2012, 529 uterine cancer cases were diagnosed in Alberta (**Figure 11-3**). ASIRs for uterine cancer in Alberta were generally higher than ASIRs in Canada.

It is estimated that 600 cases of uterine cancer will be diagnosed in Alberta in 2017.

Figure 11-4: Age-Specific Incidence Rates for Uterine Cancer, Alberta, 2008-2012



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

Uterine cancer incidence begins rising at age 30, peaking at age 65, and then declining in older ages (**Figure 11-4**).

Uterine Cancer Mortality

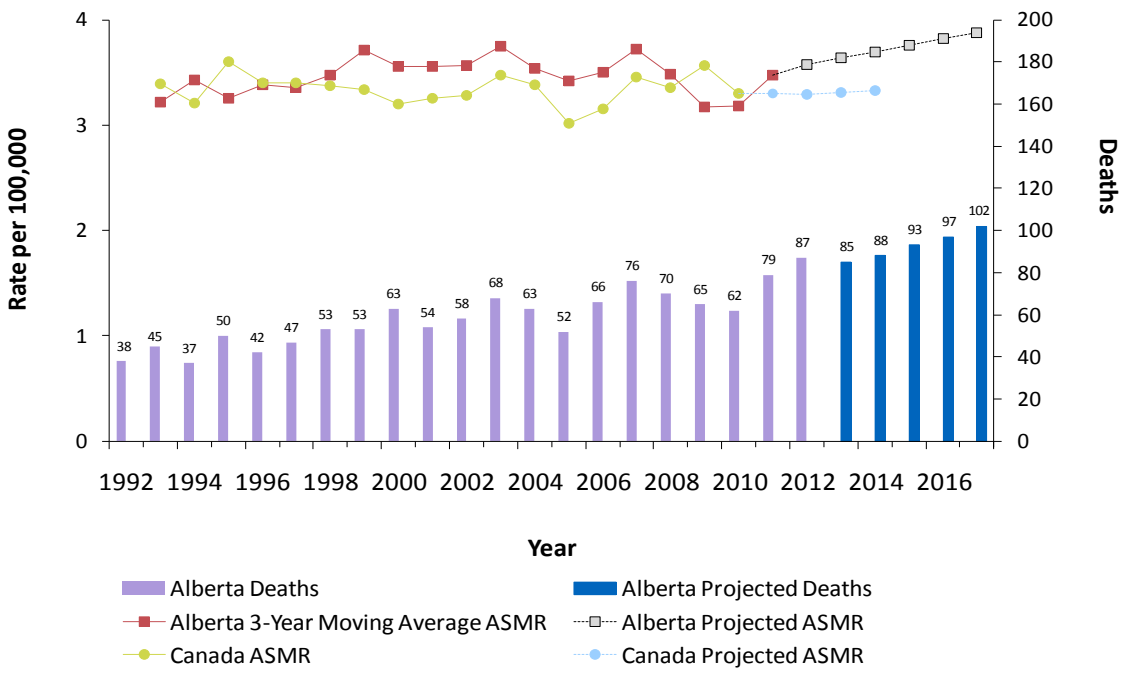
The following two figures (**Figures 11-5** to **11-6**) provide information on uterine cancer mortality in Alberta. The number of deaths in Alberta is affected not only by changes in the underlying risk of dying from uterine cancer, but also by the changes in the age structure and growth of the population. In order to compare trends over time, age-standardized mortality rates (ASMRs) are provided.

In **Figure 11-5** observed age standardized mortality rates are shown for 1992 to 2011 (three-year moving averages), ***projected*** rates for 2012 to 2017, and observed numbers of uterine 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 uterine cancer mortality rates were calculated by extrapolating the historical trends in age-specific rate based on data from 1987 to 2011.

Figure 11-5: Actual and Projected Number of Deaths and Age-Standardized Mortality Rates (ASMRs)*† for Uterine Cancer, Alberta, 1992-2017



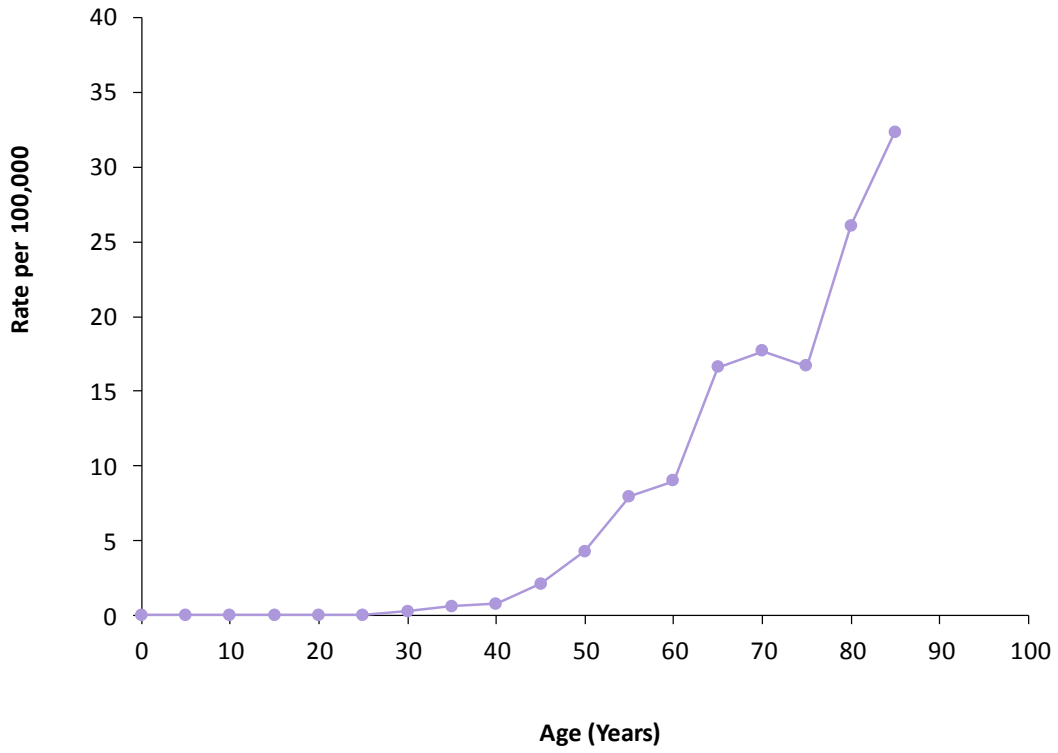
* Three-year moving average.
† Standardized to 1991 Canadian population.

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

In 2012, 87 females died from uterine cancer in Alberta (**Figure 11-5**). ASMRs in Alberta were generally higher than ASMRs in Canada.

It is estimated that 100 females will die from uterine cancer in Alberta in 2017.

Figure 11-6: Age-Specific Mortality Rates for Uterine Cancer, Alberta, 2008-2012



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

Uterine cancer mortality rates increase gradually after about age 30 (**Figure 11-6**). The highest uterine cancer mortality rates occur in the older age groups.

Uterine 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.

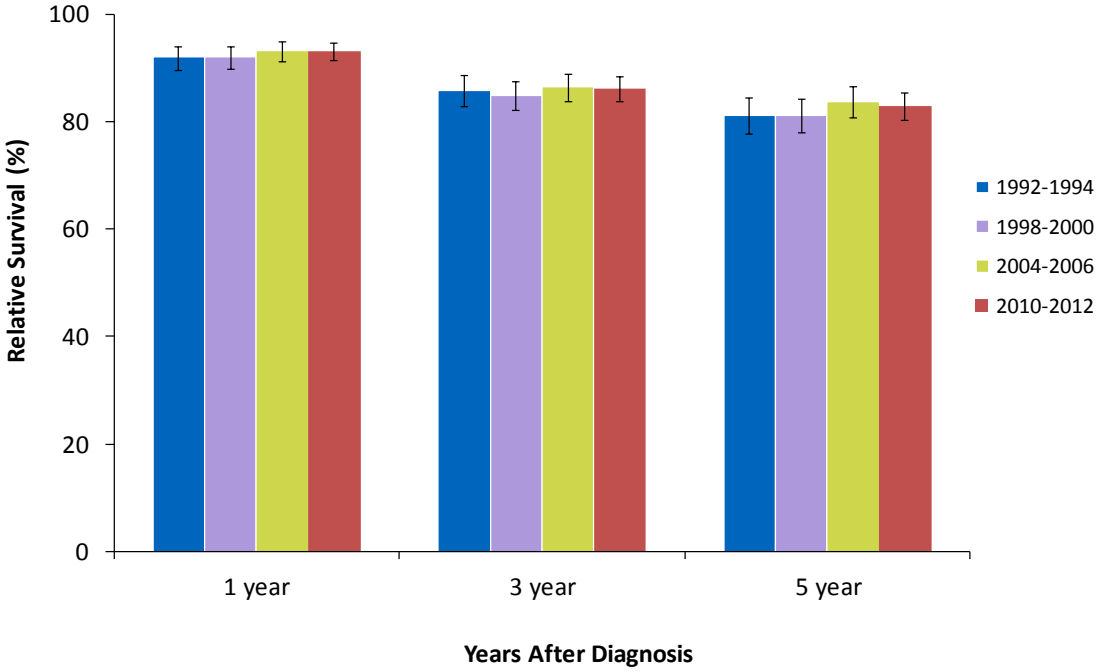
Survival depends on several factors including the cancer type (most importantly site, stage, and morphology at diagnosis), sex, age at diagnosis, health status, and available treatments for that cancer. While ***relative survival ratios*** (RSRs) give a general expectation of survival over the whole 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.

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 11-7: Age-Standardized One, Three and Five-Year Relative Survival Ratios with 95% Confidence Intervals (CI) for Uterine Cancer, 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 uterine cancer in the period of 2010 to 2012 is estimated to be 83%.

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

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.

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